FIFTY YEARS' REPUTATION

Hunyadi János

Natural Aperient Water

has now been prescribed by Practitioners of all countries for nearly half a century, and their unanimity concerning its supreme excellence is strikingly displayed in the emphatic verdict of approval which has been returned by Doctors the world over.

When we find men of such undisputed eminence in their several lines as *Professor Virchow; Professor Moleschott,* of Rome; *Professor von Esmarch,* of Kiel; *Professor Lombroso,* of Turin; *Dr. Chas. Fauvel,* of Paris; *Professor Fred. T. Roberts, Dr. Lewis A. Sayre,* of New York; *Professor Wm. A. Hammond,* late Surg.-Gen. of the United States Army; *Professor von Bamberger,* of Vienna; *Professor Vanlair,* of Liege, referring to HUNYADI JÁNOS in warm and even enthusiastic terms, nothing more is needed to show that, in point of medicinal qualities, it must be something quite out of the common.

PROPRIETOR OF THE SPRINGS—

ANDREAS SAXLEHNER, BUDAPEST.

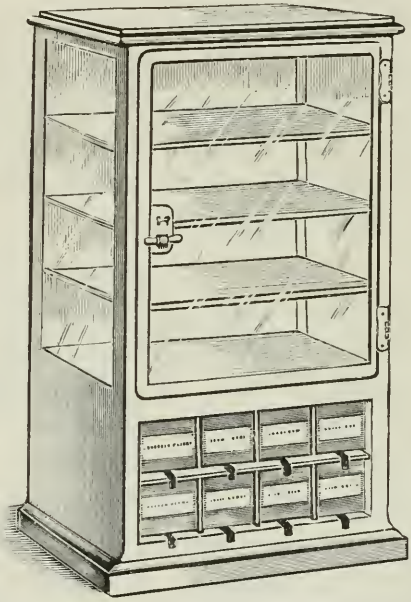
Samples and Literature Free to Medical Men on application to the
LONDON Agency: Trafalgar Buildings, Charing Cross, W.C.

SUMNER'S

Combined Instrument and Dressing Cabinet.

34 inches high, 18 inches wide, 11 inches deep.
A most useful and ornamental piece of furniture for Surgery or Consulting Room.

PRICE, including Dressings, etc., £5 nett.



PRICE, including Dressings, etc., £5 nett.

The upper portion is a well-made white enamelled cupboard, with glass front and sides, three glass shelves, plated lock and hinges.

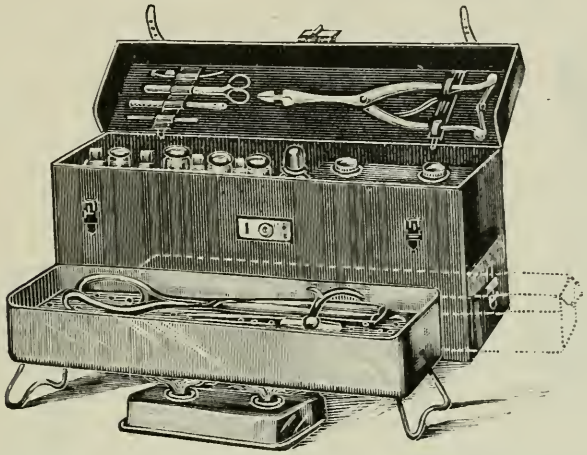
The base or lower portion is of metal, and is divided into eight compartments to hold boxes of Dressings, &c. The boxes are dust-proof, and made of strong cardboard, to which tapes are attached to facilitate their removal from the pigeon holes.

The Dressings usually supplied are Boric Wool, Cyanide Gauze, Alembroth Wool, Bandages, Muslinette (Waterproof Material) Absorbent Gauze, Absorbent Lint, and Adhesive Plaster on reels, but of course these can be varied as desired.

When Dressings are exhausted, they can be replaced, if wished, in new cardboard boxes at a trivial cost.

R. SUMNER & CO., LTD., LIVERPOOL.

Modern and Improved MIDWIFERY BAG WITH STERILIZER.



The bag is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

The Sterilizer has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the Bag, together with Sterilizer, Lamp, Nail Brush in plated case, Minim measure in case, Chloroform Bottle in plated case, Dredger, 3 Pill Bottles, 3 Medicine Bottles.

£3 10 0 net (or £4 4 0 if of solid leather throughout.)

An outside Canvas Cover can be supplied at 7/6 extra.

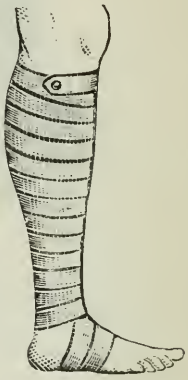
R. SUMNER & CO., Ltd.,

SURGICAL INSTRUMENT MAKERS, LIVERPOOL.

THE "PUTTEE" LEG BANDAGE

FOR VARICOSE VEINS, etc.

THESE are elastic Bandages fitted with a loop for the foot, and fastened at the top with patent spring fasteners.



The advantage is that the bandages are quickly adjusted, and always keep in position.

They are preferable to an Elastic Stocking as they can be adapted to any required pressure, and are cooler and lighter in weight.

They require no measurements or fitting, and are only about half the price of stockings.

WE MAKE IN TWO SIZES.

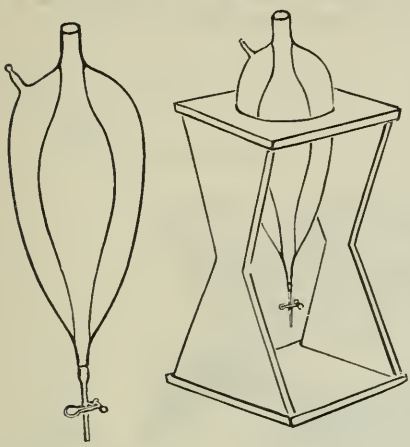
To reach the Knee (9 feet by 2½ inches), 2/- each.

To reach the Thigh (13½ feet by 2½ inches), 3/- each.

SPECIAL SIZES MADE TO ORDER.

R. SUMNER & CO., LTD., LIVERPOOL.

Apparatus for Intravenous Administration.



The difficulty of keeping a solution at an even temperature during administration, led Mr. Arthur J. Evans, F.R.C.S. Edin., Hon. Surg. Liverpool Stanley Hospital, to design a flask on the Dewar principle, which has proved very successful.

The inner portion has a capacity of 500 c.c. and is separated from the outer by a vacuum.

Warm fluid allowed to stand in the flask loses only 3°F in half-an-hour, so that in the ordinary time taken for administration, only 1°F is lost.

The apparatus is well adapted for any purpose in which it is necessary to introduce warm fluids into the body, via the veins, tissues, or rectum, without the cumbrous method of keeping the solution warm by means of spirit lamps, water baths, &c.

PRICE (including stand, tubing, clip and special needle designed for direct introduction into the vein without making an incision) **25/-**

Sea Water Plasma. For Injection.

We beg to inform Members of the Medical Profession that we collect and pasteurize SEA WATER according to the method advised by Dr. SIMON, and prepare the PLASMA by diluting three parts of the pure sea water with five parts of sterile water.

RECOMMENDED IN THE TREATMENT OF

Infantile Gastro-enteritis, Gastric and Intestinal Disorders in Adults, in Anæmia, Chlorosis and Skin affections.

For technique, dosage, &c., see Medical Annual, 1910, pages 98 to 107.

SUPPLIED IN STERILE BOTTLES OF 16-oz. CAPACITY AT **2/-** EACH, OR IN 50 OR 100 c.c. AMPOULES AT **1/-** EACH.

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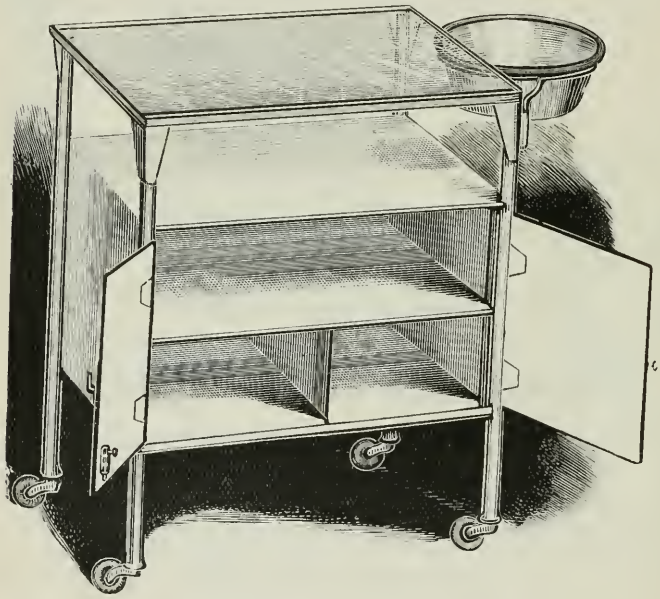
ASEPTIC
DRESSING TABLE & CABINET

THIS table is made from the best cold drawn steel tubes, and japanned with white enamel in stoves at a temperature that renders the surface hard and lasting.

THE PRICE IS EXCEEDINGLY MODERATE.



Price £3 3s.

Measurements of Table:—Height 32 in. ; Width 22 in. ; Depth 17 in.
Measurements of Cabinet :—Height 13 in. ; Width 22 in. ; Depth 17 in.

The top is plate glass, the underneath shelf and cabinet are made of metal. It is provided with a bowl for antiseptic solutions, and is mounted on rubber wheels. It is an ornamental, useful and much desired addition to any surgery or consulting room.

R. SUMNER & Co., Ltd.,

Surgical Instrument Makers,
LIVERPOOL.

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Fig. 1.

Fig. 1.
APRONS, as suggested and worn by Mr. Thelwall Thomas, of Liverpool.

Price 9/- each.

Measurements required—
Circumference at chest, and length desired.

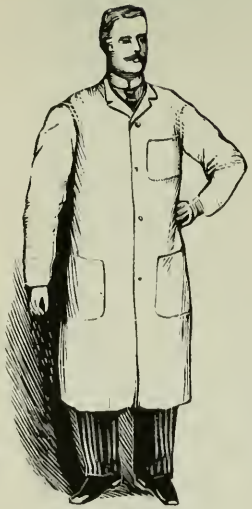

Fig. 2.

Fig. 2.
COAT, with three pockets.

Price—**18/-** ea

Measurements required—
Circumference at chest, length of sleeve, and length of coat desired.

Fig. 3.

Fig. 3.
OVERALLS, with Helmets, for infectious cases.

Price—**15/-** ea.

Measurements required—
Circumference round neck and chest, length of sleeve, and length of overall desired.

Muslinette Aprons and Coats for Surgeons and Accoucheurs, Overalls for Physicians in Attendance on Infectious Cases.

MUSLINETTE is a light waterproof material that can be washed and treated with antiseptics. It is unaffected by a temperature of 212° F., and therefore can easily be rendered aseptic.

They can also be supplied in WHITE DRILL: Aprons, 5/-; Coat, 7/6; Overall, 8/- each.

LACTOPHOSPHENE

A TONIC FOOD

consisting of the Glycero-phosphates of Sodium, Calcium and Magnesium, in combination with Pure Milk Proteid.

THIS PREPARATION, which contains phosphorus in an easily assimilable form, possesses highly stimulating properties, and is a most valuable adjunct to the diet of invalids and convalescents.

Owing to the presence of those elements necessary to the condition of muscular and nerve tonicity, it is particularly indicated in cases of **Neurasthenia** and of physical debility arising from **Malnutrition.**

Lactophosphene is also of the greatest value in the treatment of those affections producing hypersensitivity of the alimentary canal, such as **Gastritis, Gastric** or **Duodenal Ulcer,** and **Intestinal Catarrh.**

Being entirely purin-free, it produces no uric acid, and is therefore admirably adapted as a Food for Gouty and Rheumatic subjects ; also owing to the fact that it contains no carbohydrates, it can be given with confidence to **Diabetics.**

DOSAGE.

Adults.—Two teaspoonfuls three times a day. Even more may be taken without causing digestive disturbance.

Children.—From one to two teaspoonfuls twice a day, according to age.

Infants.—A few grains added to each alternate bottle of milk.

METHOD OF ADMINISTRATION.

Lactophosphene may be added to food to increase its nutritive properties, or it may be taken in water or other liquids.

When used with food, it may either be added in the cooking or afterwards, as desired.

Taken in fluids, the required quantity of **Lactophosphene** should first be mixed into a paste with a small quantity of the liquid, and then the remainder added gradually, stirring constantly.

Lactophosphene may be taken in any liquids, either hot or cold, but not with those of an acid nature, such as Lime Juice, Lemonade, etc.

Prices 1/- and 2/6 per tin.

Lactophosphene Chocolates

A FOOD-SWEETMEAT.

These Chocolates, which are composed largely of **Lactophosphene,** may be taken by the most delicate children and invalids, and will be found of the greatest value in **Rickets, Anæmia,** etc., also in convalescence following **Nervous Breakdown, Influenza,** etc.

The attractiveness of their form enables delicate children and invalids to be given a sustaining and nourishing food without constraint, as they are as agreeable and pleasant to take as ordinary chocolates.

Price - 1/- per box.

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THE SWISS SERUM & VACCINE INSTITUTE, BERNE.

The Scientific Director of which is

Dr. W. KOLLE, Professor of Bacteriology, University of Berne.

THIS establishment, which is one of the largest and best known in the world, is under the direct control of the Swiss Government. The supervision of the Institute not only includes the testing of the various Sera, Vaccines, &c., before they are offered for sale, but is also extended to the methods employed for the preparation of the products, and the continual inspection of the animals. The utmost reliance can therefore be placed in these preparations, and we always carry full stocks of :—

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ready for immediate despatch.

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CALF LYMPH.

We have pleasure also in intimating that we are Sole Agents for the NATIONAL VACCINE INSTITUTE OF DUBLIN, which institution is under the strict supervision of Government Bacteriologists, who issue annual reports to the Local Government Board. The greatest confidence can therefore be placed in the **Lymph** supplied.

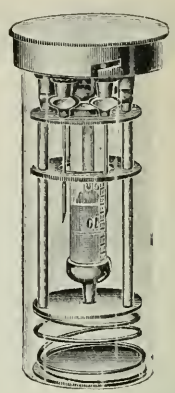
PRICES : { **Large Tubes** (sufficient for 3 to 5 Vaccinations), 1/- per tube ; 10/- doz.
Split Tubes (sufficient for 1 or 2 Vaccinations), 6d. per tube ; 5/- doz.

SPECIAL QUOTATIONS GIVEN FOR LARGE QUANTITIES.

R. SUMNER & CO., Ltd., LIVERPOOL.

CAIRD'S

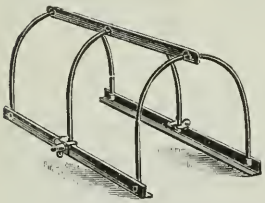
Hypodermic Syringe with Sterilizing Bottle.



The Syringe, a 20 minim size, is suspended together with six needles in a glass tank $3\frac{3}{4}$ by $1\frac{1}{4}$ inches. The tank has a bayonet-pointed metal cap, lined with a special washer which makes it quite water- or spirit-tight. The Syringe and Needles can therefore be kept ready sterilized by suspending them either in Alcohol or a solution of Cresol, thus saving the operator the necessity of boiling the instrument each time it is used.

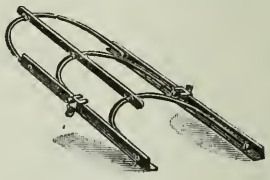
It has a strong outer Metal Nickel-plated Case in which it is very securely carried.

Price **15/-** each.



PATENT FOLDING IRON BED CRADLES

For Removing Pressure of Bedclothes.



In three sizes, price per set of three, **21/-**.

The storage of bed cradles hitherto has been a source of inconvenience, as they take up so much room and are so unwieldy. This new pattern obviates this, as they fold up into a small compass.

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RUBBER GLOVES.

Medium Thickness.
First Class Quality.

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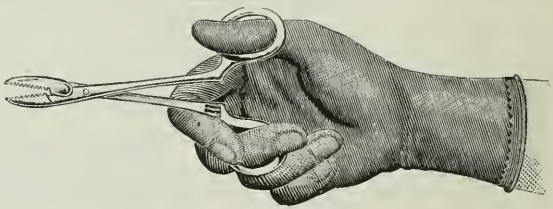
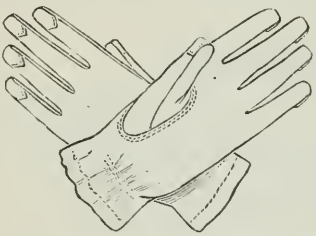
21/- per doz. pairs.





COTTON GLOVES,

with "Sensitive" Finger Tips, so constructed that the seam or joint at the extremity of finger tips is carried over to the back of the finger, so that the sense of touch is fully retained. In sizes $7\frac{1}{2}$, 8, $8\frac{1}{2}$.

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LYMPHOID COMPOUND (LOWENTHAL)	OVAMAMMOID COMPOUND (LOWENTHAL)	LYMPH SERUM (LOWENTHAL)

These modern and scientific organotherapy products are being extensively prescribed in conditions, having as their origin, Degeneration, Metabolic Disorder, Imperfect Functioning, Auto-Intoxication, Fatigue, and Exhaustion.

The results secured are stated by Practitioners to be completely satisfactory, even in cases unresponsive to other therapy.

The FORMULA of the LYMPHOID COMPOUND (Lowenthal). (In Soluble Capsules.)

Ext. Lymphatic Glands, Testes, Spinal Cord and Brain	... gr. 2	Glycero Phosphate Sodium and Calcium	gr. 2
Glycero Phosphate Iron	... gr. ½	Aloin (when indicated) ...	... gr. $\frac{1}{20}$th

THE FORMULA OF THE LYMPH SERUM (Lowenthal).
(For Hypodermic or Intramuscular Injection.)

Orchitic fluid. Extracts from Lymphatic Glands, Spinal Cord and Brain of young and healthy animals. Bi-chloride of Gold and Sodium ($\frac{1}{50}$th gr. to 10 minims of Lymph Serum) are employed for preservation purposes. The Salt is rendered compatible with animal matter. With the microscope ($\frac{1}{8}$th objective) the serum will be found rich in perfectly preserved Spermatozoa, Leucocytes, Crystals of Lecithin, Chloride of Sodium, Nucleinic Acid and Spermine.

THE FORMULA OF THE OVAMAMMOID COMPOUND (Lowenthal).
(In Soluble Capsules.)

Ovarian Extract	gr. 1	Mammary Gland Extract ...	gr. 1
		Lactose (Excipient) ...	gr. 3

The **LYMPH COMPOUNDS (Lowenthal)**, are being employed with exceptional success in:—

Neurasthenia, whether of the usual type or following Influenza, Operation, or Shock.	Neuritis and Peri-neuritis.	Osteo-Arthritis.	Heart and Blood Vessel Degeneration.
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Neuralgia.	Rheumatoid Arthritis, and other Rheumatic Affections.	G.P.I., early.	
		Friedrich's Disease.	
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The **OVAMAMMOID COMPOUND (Lowenthal)**, is being employed with exceptional success in:—

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	Sexual Apathy in Women.	Metrorrhagia.	
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A representative report from a British Practitioner (typical of many more) reads as follows:—

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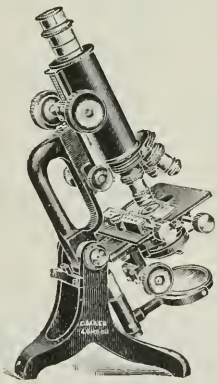

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(as figured), with mechanical stage *built on the stand*, Abbe condenser and iris diaphragm, triple nosepiece, 2 eyepieces. Objectives: $\frac{3}{4}$, $\frac{1}{6}$, $\frac{1}{12}$ oil immersion N.A. 1.30: this latter gives an *exceptionally flat field and perfect definition.* In mahogany case **£22 5 0**

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Adaptable mechanical stage, **£3.**

New formula $\frac{1}{6}$ in., **£1 10 0.** New formula $\frac{1}{12}$ in. oil immersion, N.A. 1.30, **£5 0 0.** New formula $\frac{1}{16}$ in. oil immersion, N.A. 1.32, **£6 10 0.**

Oil Immersion Paraboloid Condenser for the examination of living bacteria under high powers, **£1 10 0**

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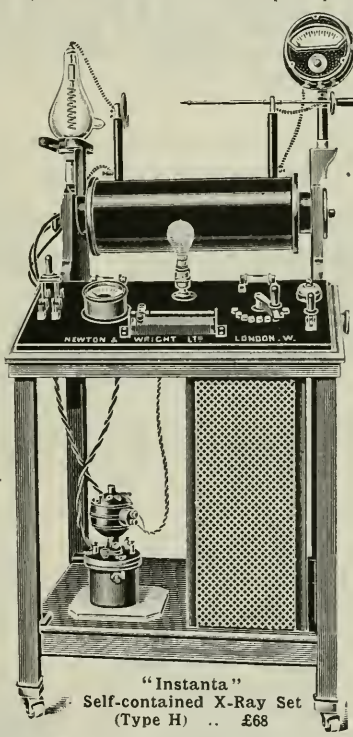

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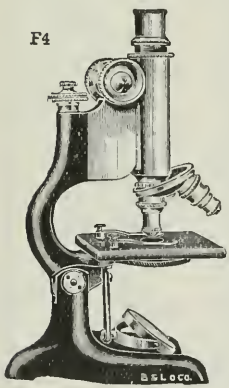

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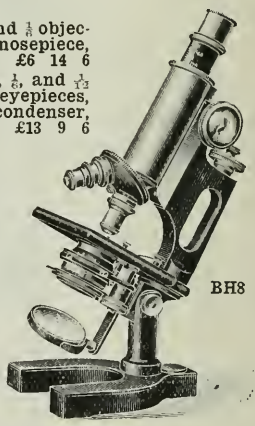
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CENTRIFUGES.

Single Speed ..	31/3
Double ,, ..	£1 9

Also Electrical and Water Power.

Microtomes, Photomicrographic and Projection Apparatus, Precision Laboratory Glassware, etc.

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X-Ray Apparatus.

Single-Impulse Outfits.

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X-Ray Couches and Screening Stands.

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Surgical Instrument Maker and Cutler,

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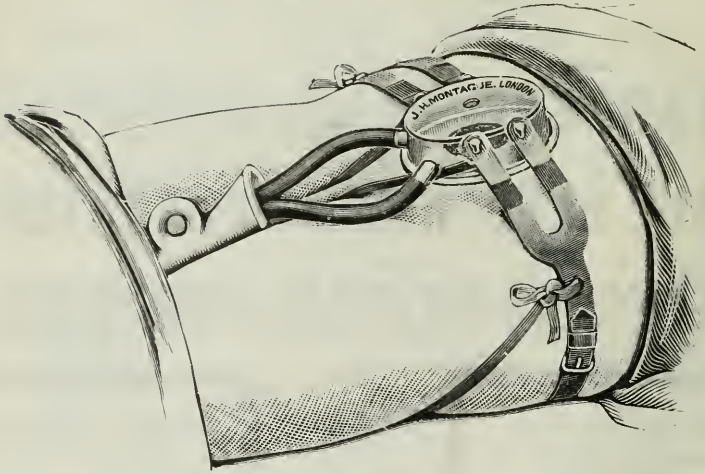
SUPRA-PUBIC
DRAINAGE APPARATUS.

Devised by Dr. HAMILTON IRVING.
Vide *The Lancet*, December 21st, 1907.



A Simple Method of keeping the Patient dry and comfortable after the Operation of Supra-pubic Cystotomy, and saving all other dressing.

FULL PARTICULARS SENT ON APPLICATION.

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Specialists in X-RAY and all ELECTRO-MEDICAL APPARATUS.

The New Earth-free "MULTOSTAT."

Free from all possibility of earth shocks, and giving TRUE (not pulsating) Galvanic Current.

The REAL Universal Apparatus for the following approved methods of treatment :—

GALVANIZATION, Ionic Medication, Electrolysis, Leduc Intermittent Continuous Current, &c.
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SCHNÉE 4-CELL BATH.
HYDRO-ELECTRIC BATHS, full and local.
LIGHT } Separately or
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BIER'S HYPERÆMIC TREATMENT, NEBULOR SPRAYS for Nose and Throat.
AIR-PUMPS FOR MASSAGE.
VIBRATORY MASSAGE.
SURGICAL OPERATIONS with Burrs, Trephines, &c.
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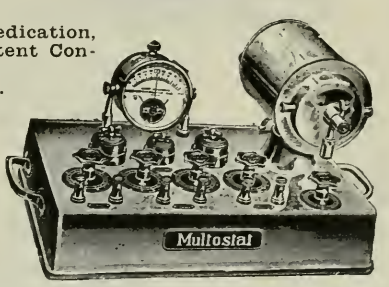

Write for "New Book of the New Multostat," post free to Medical Profession."

We also SPECIALISE IN THE MANUFACTURE of

X-RAY APPARATUS
Sanax Outfits for Flash, Instantaneous, Tele- and Time Exposures, for Screen Examination, and for Therapeutic Treatment.
Sanax Intensified Spark Coils.
Sanax Interrupter, Sanax Intensifying Screens, Sanax Protecting Appliances, &c.
HIGH-FREQUENCY APPARATUS of every description.
Thermo-Penetration Apparatus.
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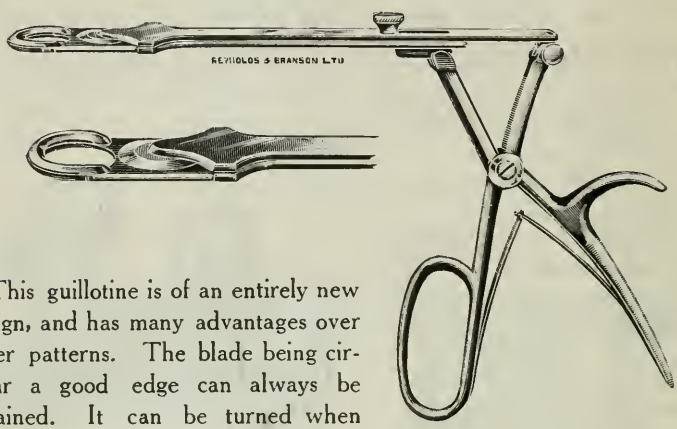
Works: 9 and 10, BENTINCK MEWS, W.

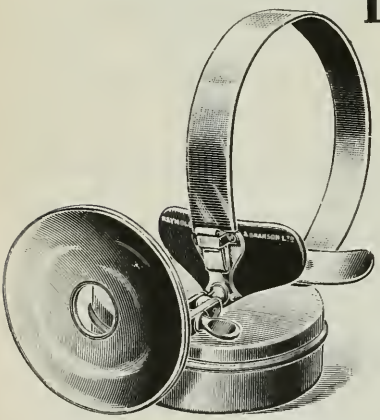
TONSIL GUILLOTINE

"RYSTOS."



This guillotine is of an entirely new design, and has many advantages over other patterns. The blade being circular a good edge can always be obtained. It can be turned when necessary. Should the blade require sharpening, it can be easily removed from the guillotine. Instead of the usual ring handle a powerful cross action handle is fitted, which is comfortable, easy to grip, and ensures a firm and steady control of the guillotine.

Price 30/-



LARYNGOSCOPIC MIRROR.

A New Portable Form with the following Advantages.

The central aperture is larger than in the ordinary pattern. The mirror is attached by means of a ball and socket joint to a light spring headband. The back of the mirror and the case are made of aluminium, thus making it very light.

Price ... 12/6.

REYNOLDS & BRANSON, Ltd.

Telegrams: "REYNOLDS, LEEDS."

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COX'S X-RAY AND ELECTRO-MEDICAL APPARATUS

Rectifying Interrupters
For use on Alternating Currents.

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HIGH FREQUENCY APPARATUS.

Cox Radial Mercury Interrupter.

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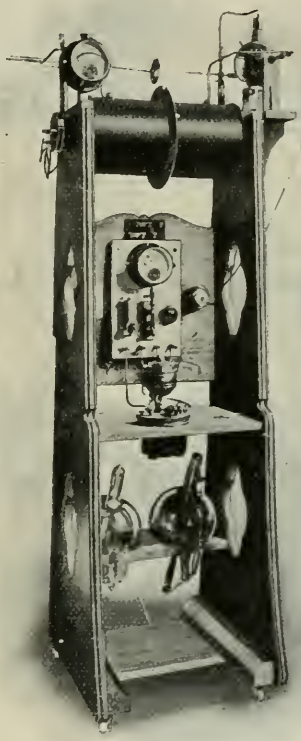
Apparatus for **Ringworm Treatment.**

LIGHT BATHS. HYDRO-ELECTRIC BATHS, CARBONIC ACID BATHS, etc.



Apparatus for Bismuth Meal Examination,
Designed by Dr. A. C. JORDAN, of Guy's Hospital.

Universal Apparatus (Earth Free) **for Cautery, Light, Medical Currents, etc.**

Complete Estimates
For Hospitals, Hydros, Medical Institutions, Nursing Homes, etc.

COMPLETE SETS FOR X-RAY WORK.

Pioneers of the small primary current, heavy discharge apparatus, requiring no regulating resistances, and working from the ordinary electric light :: wires. Fully guaranteed for 3 years. ::

Cox's "STANDARD" Set (*as illustrated*) giving up to 30 M.A., 10 inch spark to 16 inch spark. Prices from **£40.**

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Contractors to the War Office, Admiralty, India Office, Colonial Governments, and the principal Hospitals at Home and Abroad.

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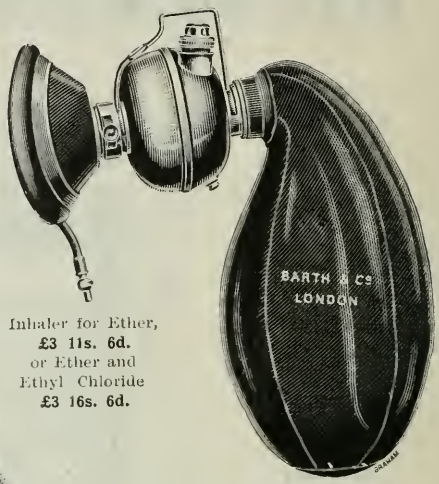
Anæsthetic Apparatus.

Oldest Manufacturers of

Compressed Nitrous Oxide.



Inhaler for Ether,
£3 11s. 6d.
or Ether and
Ethyl Chloride
£3 16s. 6d.

CAUTION.

We are the only authorized makers of this apparatus. All Inhalers or Illustrations purporting to be Sir FREDERIC HEWITT'S DESIGN without our name on them are spurious imitations.

N.B.—All our anæsthetic appliances can be obtained **direct** at above address.

Inhaler for Gas and Ether **£5 17s. 6d.** (without cylinders)

With Cylinders and patent combined fitting, **£9 12s. 6d.**

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- LATEST IMPROVED -

Wide-Bore Inhaler

FOR

Ether, Gas and Ether, or Ether and Ethyl Chloride.

Advantages.

No restriction to breathing.

Patient does not smell ether before an administration.

Reservoir can always be refilled whilst on the face.

Does not weigh more than an ordinary Clover.

Face-pieces cannot become detached from Reservoir when in use.

Cylinders have Barth's patent combined Stand and Union.

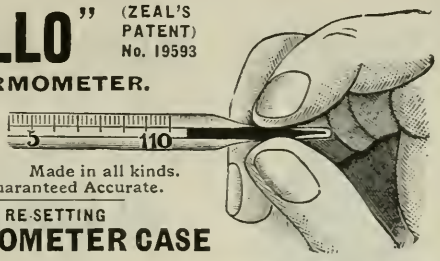
All fixing done by one screw.

Makes the changing of cylinders much simpler and quicker.

THE "REPELLO" (ZEAL'S PATENT) No. 19593

CLINICAL THERMOMETER.

No Shaking required.



A 30 sec. reset instantly. Made in all kinds.
Kew Certificated. Guaranteed Accurate.

ZEAL'S PATENT RE-SETTING

CLINICAL THERMOMETER CASE

No. 23910/10.

To re-set index place Clinical Thermometer in case, bulb downwards, screw on cap, holding flattened end between thumb and index finger with bulb end upward, give two or three shakes and the index is reset immediately.

All risk of breakage avoided. The Spring holds the case securely in the pocket, and prevents the tube being broken by falling out. A real boon to Doctors. The last word in re-setting devices.

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Wholesale Manufacturer of all kinds of Clinical Thermometers.

COMMONSENSE HEALTH

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STAPLES

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"CANNOT SAG"

THE OLD WOVEN WIRE SAGS CROOKS

THE SPINE TWISTS THE ABDOMEN

RESULT—BACKACHE "NERVES" INDIGESTION

STAPLES "CANNOT SAG"—SEE HOW THE SPRINGS MOULD THEMSELVES TO THE FIGURE RESULT—SPINE STRAIGHT ABDOMEN STRAIGHT—HEALTH LUXURY

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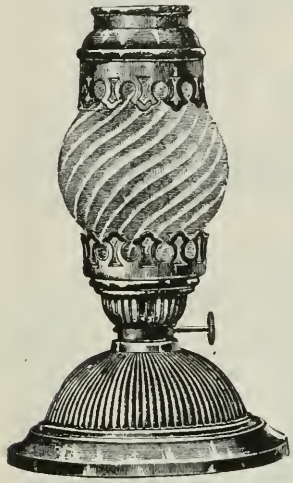
AND SAY IF A FREE TRIAL INTERESTS YOU

BUYABLE AT ARMY & NAVY, HARRODS, HEALS, SHOOLBREDS, MAPLES AND ALL HIGH CLASS SHOPS 3'0 40/6 4'6 45/- STAPLES CHITTY ST WORKS LONDON.W.

THOROUGH ROOM DISINFECTION.

As described at the Leeds Congress of the Sanitary Institute, 1897, *and at the Meeting of the British Medical Association at Edinburgh*, 1898.



By Royal Letters Patent.

ALFORMANT "B"

By means of this Lamp Schering's Dry Formalin Tablets can be converted into free Formic Aldehyde Gas.

In Tuberculosis, Whooping Cough, Influenza, and all infectious Diseases one Tablet should be placed in the outer pan frequently during the day, and allowed to gasify slowly.

This Lamp is an excellent Deodorizer, and should be used in cases of foul-smelling Ulcers, Gangrene, etc., etc.

SCHERING'S PURE FORMALIN

(Forty per cent.)

Clean, effective, non-poisonous; most powerful Disinfectant and Deodorant.

One Gallon added to Thirty-nine Gallons of water makes Forty Gallons of a Powerful and unequalled Disinfectant and Deodorant Fluid.

SCHERING'S GLUTOL (Dr. SCHLEICH)

Is the ideal antiseptic in the treatment of fresh or infected wounds, forming a firm scab in a short space of time.

For literature and particulars apply to

The Formalin Hygienic Co., LTD.,

3, Lloyd's Avenue, LONDON, E.C.

RADIUM EMANATION THERAPY.

This Apparatus for rendering WATER RADIO-ACTIVE, may be hired or purchased by Patients for home treatment.

It is supplied to the MEDICAL :: PROFESSION or on Prescription only.

DOSAGE :
From 1 to 10 Electro-Static Units per day.

Radium Emanation Treatment is indicated in the following conditions:

Diabetes-Mellitus, Albuminuria, High Arterial Tension, Rheumatoid Arthritis, Rheumatism, Gout, also Affections of a Rheumatic and Gouty origin, Neuritis.

Radium Compresses ✲ Radio-Active Earth Oxygen Bath Salts.

OUR APPARATUS is being extensively used by many of the foremost Physicians both in this Country and on the Continent. For full particulars and Literature write :

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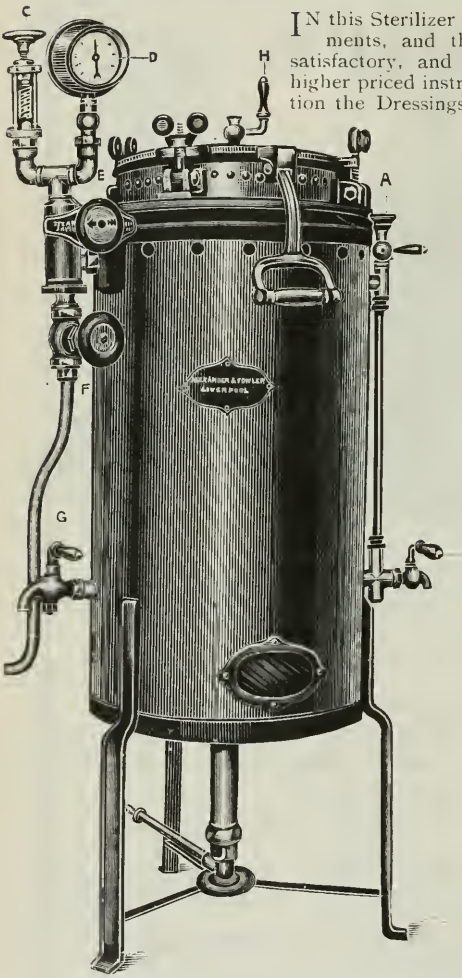
NEW PATTERN VERTICAL HIGH PRESSURE STEAM —— DRESSING STERILIZER



IN this Sterilizer are embodied all the latest improvements, and the results obtained are absolutely satisfactory, and constitute an advance on those of higher priced instruments. On completion of Sterilization the Dressings will be found perfectly dry. It is equipped with Ejector with Combined Vacuum and Inlet Valve, Combined Pressure and Vacuum Gauge and Safety Valve. The Ejector gives a Vacuum of 8 in., a result hitherto seldom, if ever, obtained in a sterilizer working, as this does, at a pressure of 15 lb. per square inch.

The Inner and Outer Jackets are of heavy gauge solid drawn copper tubes, rivetted together to an annular gunmetal ring.

The Lid is fitted with a special metallic joint, undercut into itself and cast in under pressure, and is hinged; while a special pattern Lever Handle of sufficient length to avoid any risk of scalding the operator, provides an easy means of raising it. This Lever, being provided with a stop at back, swings clear of the Lid while open. The fly-nuts for securing the lid are heat insulated. All fittings and castings are of best gunmetal, truly machined and faced, and all materials and workmanship are of the best of their respective kinds.

Inner Chamber measures 20 by $9\frac{3}{4}$ in.

Built and equipped for Gas or Steam, complete with two Nickel-plated Drums £27

New Pattern Horizontal Type, with all the latest improvements, giving 10 in. vacuum and 15 lb. pressure. Inner Chamber measures 22 by 15 in. Built and Equipped for Gas or Steam ... £60

—— Specification and Particulars on request. ——

ALEXANDER AND FOWLER,

Surgical Instrument Makers to the Royal Infirmary, Royal Southern Hospital, and other Institutions.

104, Pembroke Place, LIVERPOOL.

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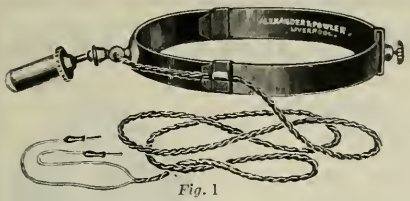


Fig. 1

FIG. 1—

PORTABLE ELECTRIC FOREHEAD LAMP

with 4 volt metallic filament bulb.

The flexible head band is adjustable, so that it can be carried in hand bag or coat pocket, and is easily and quickly adapted to the head when in use.

The bulls eye lens with holder, is mounted on ball and socket joint, so that the direction of the rays of light can be altered at will. For Diagnostic or Operative work it will be found of great assistance, as it can be carried to the patient's house and used with small dry battery or accumulator, as source of electric supply.

Price with Cords and Plug Terminals ..	12 6
Dry Battery	1 9
Spare Bulb	1 3

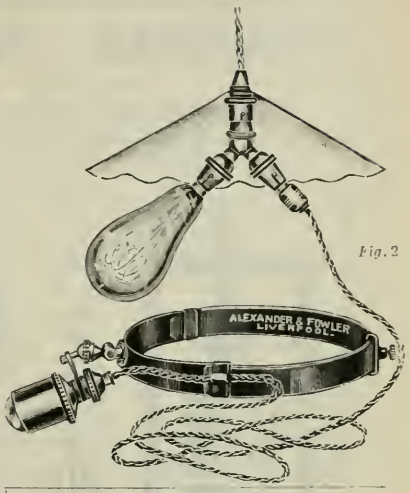


Fig. 2

FIG. 2—Similar Apparatus for use on Electric Main Supply. Complete with Cords. Resistance Lamp, and Adapter to plug into ordinary lamp holder, **25/-**

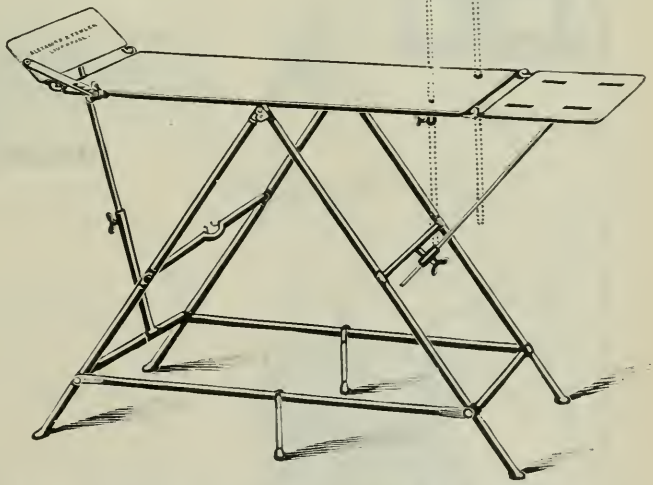
Spare Bulb	1 9
Spare Resistance Lamp	2/3

When ordering Outfit No. 2, please state voltage of current supply.

PORTABLE OPERATING TABLE.

Giving Trendelenburg and Lithotomy positions.

The table top detaches from the stand, when the latter is folded, thus economising space.



Size when ready for transport, 42 × 23 × 5

Weight about 39 lbs.

Painted Aluminium, **£9 10s.**

Canvas Case, **£1 5s.**

Leg Holders, **20s.**

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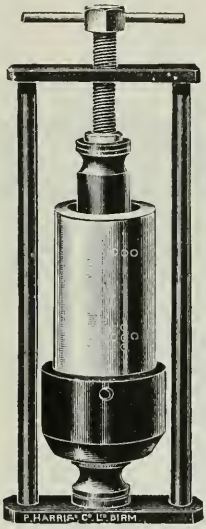
HARRIS' SPECIALITIES

CARBON DI-OXIDE SNOW

as suggested by J. Hall-Edwards, L.R.C.P., F.R.S., F.R.P.S.

See LANCET, July 8th, 1911, pages 87 to 90.



No waste, hard snow which sinks in water.

The Crayon being cone-shape a surface of any desired diameter can be obtained by cutting off the point of the cone.

PRICES—

S8400	Set complete with 4 lb. Cylinder	£3 7 6
S8401	Do., with 7 lb. Cylinder	3 15 0

Prices of Parts required to fit to own CO_2 Cylinder.

S8402	"Hall-Edwards" Collector	£1	1 0
S8403	Do. Compressor		5 0
S8404	Do. Applicator		2 6
S8405	Do. Nipple and Union		2 6

THE SNOW MADE BY THIS APPARATUS IS OF CORRECT HARDNESS—AND GOOD RESULTS OBTAINED. FULL PARTICULARS ON APPLICATION.

DIAGNOSIS LAMP

S8145 The "Perfectum" Pocket Diagnosis Lamp, complete as illustration, **4/6**

S8146 Battery Re-fills for the above ... each net **1/6**

EXTRAS—

Glass Tube into which Lamp can be inserted when making examination ... ... each **1/-**

Vulcanite Cap to place over light so as to make it size of pin head for ophthalmic purposes ... ... each **1/-**

PHILIP HARRIS & Co. Ltd., BIRMINGHAM, ENGLAND.

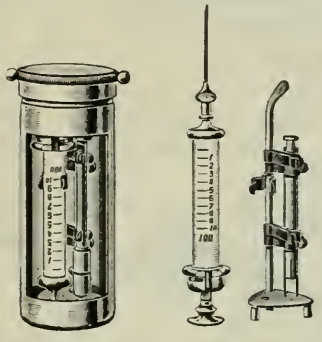
HARRIS' SPECIALITIES

TUBERCULIN SYRINGES.

It is imperative that these should be accurately graduated, and capable of rapid sterilization. We suggest the "HARRIS RECORD" SYRINGE as particularly suitable, having been specially designed to fulfil these conditions.

The instrument of 1 c.c. capacity, plainly graduated in $\frac{1}{10}$th c.c., and by means of the outer container (which is filled with absolute alcohol), can be kept in a perfectly aseptic condition.

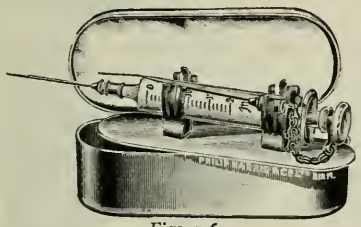
Can be supplied with either Glass or Metal Container.



P HARRIS & Co LTD

Price (without absolute alcohol), **10/6** each net.

If filled with absolute alcohol, extra **9d.**



Figs. 7464

Fig. 7464 is an **All-Glass Syringe,** thoroughly reliable. Capacity 1 c.c., plainly graduated in $\frac{1}{10}$th c.c. This Syringe is one largely used in Tuberculin Dispensaries.

The price is—
18/- per dozen net.

The **"Harris S.K." Nasal Douche** is an ideal little instrument, effective, safe, cheap, and easy to use. The flow is easily regulated. The cylinder and nosepiece are of glass.

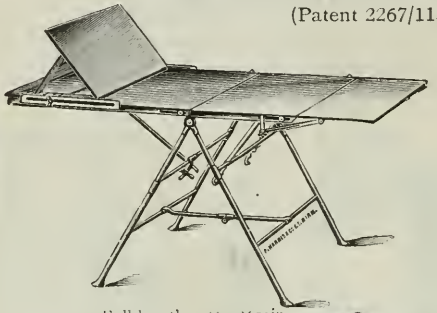
Price per dozen **12/-** net.

NASAL-DOUCHE.

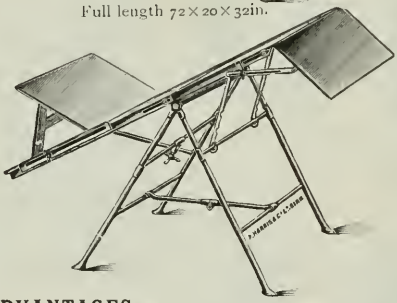
PHILIP HARRIS & Co. Ltd., BIRMINGHAM, ENGLAND.

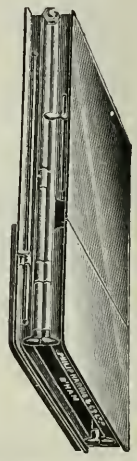
HARRIS' SPECIALITIES

A PORTABLE METAL OPERATING TABLE
ON AN ENTIRELY NEW PRINCIPLE.
(Patent 2267/11.)



Full length 72×20×32in.





Closed for Transit, 35×20×6in.

ADVANTAGES—

Can be fixed ready for use in 30 seconds.
Folds up without any loose parts.
Exceedingly light and very rigid.
Gives an excellent Trendelenburg position.
The table can be manipulated to any position while the patient is on the table.

A. "The Harris" Portable Operating Table, made in round seamless steel tubing and aluminium top, **£12 12 0**

B. "The Harris" Portable Operating Table, made in oak. Total weight about 28 lbs. ... **£7 10 0**

Waterproof Canvas case extra ... net **£1 10 0**

We have received many opinions respecting the merits of our Portable Operating Table. We print a few below :—

Nov. 14th, 1911—"Gives great satisfaction."—*Stoke-on-Trent.*

Dear Sirs—"The Table arrived safely to hand, and gives great satisfaction. I enclose cheque for same."

Oct. 5th, 1911—"Gave its rigidity a good test."—*Handsworth.*

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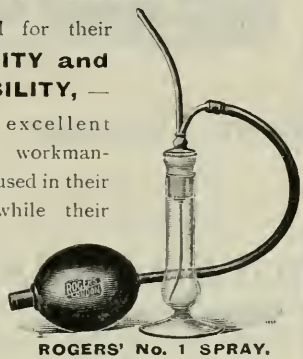

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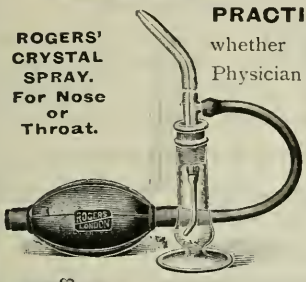

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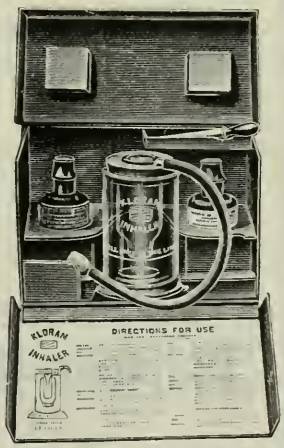

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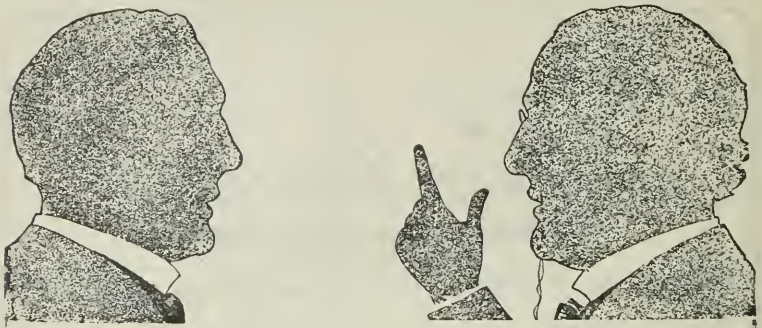

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A combination of diethylbarbiturate of soda, and diethylbarbiturate of codeine. The hypnotic action of the former is reinforced by the addition of a small quantity of the latter. Dose: two tablets before bed-time.

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Physiologically standardised preparation of the digitannoids, uniform in action and stable in composition. In powder, tablets, ampoules and solution for oral administration.

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A reliable uterine hæmostatic. Without undesired by-effects. Acts as an antiphlogistic and sedative. Dose: 2-3 tablets three times a day.

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A non-irritant intestinal astringent. Its action extends as far as to the lower portion of the large intestine. Dose: 15 grains three to five times a day. In tablets or powder.

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USUAL DOSE:— 2 bonbons or tablets; for children ½-1 bonbon or tablet.

is a combination of the isovalerianic and acetyl esters of phenolphthalein. It combines the laxative and purgative properties of this drug with the valuable properties of valerianic acid as an intestinal sedative. The action of Aperitol, owing to this sedative valerian principle, is entirely free from pain. It possesses no toxic or irritant properties, and hence may be administered even in cases of kidney disease. The motions are soft but not loose. Unlike most laxatives, Aperitol does not lose in efficacy by prolonged administration.

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DOSE:— 1-3 Pearls two to four times daily.

is the isovalerianic acid ester of borneol. The results of experiments show that Bornyval produces marked sedative and analeptic effects in neuroses of the circulatory, digestive, and central nervous systems. It contains the recognised pharmacological properties of valerian root in a definite form, but produces no undesirable effects, and there are many references in current medical literature to its pharmacology. In all conditions where valerian is indicated, Bornyval is preferable.

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DOSE:— 2 capsules three or four times daily.

consists of a solution of one part of the anæsthetic Kava resin in four parts of the purest East Indian sandalwood oil. It possesses the valuable property of a specific anodyne action on the mucous membrane of the whole urinary apparatus; it also increases the quantity of urine, but reduces purulent secretions. Gonosan combines the good properties of the best of all balsams, whilst it is free from deleterious by-effects, and excels all known remedies in its strongly anæsthetic and sedative action. Owing to its strongly astringent and bactericidal properties, Gonosan prevents the spread of the disease to the posterior urethra. In this way it guards against complications.

Samples and Literature willingly supplied to the Medical Profession.

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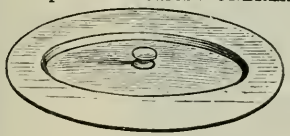

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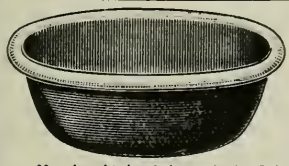

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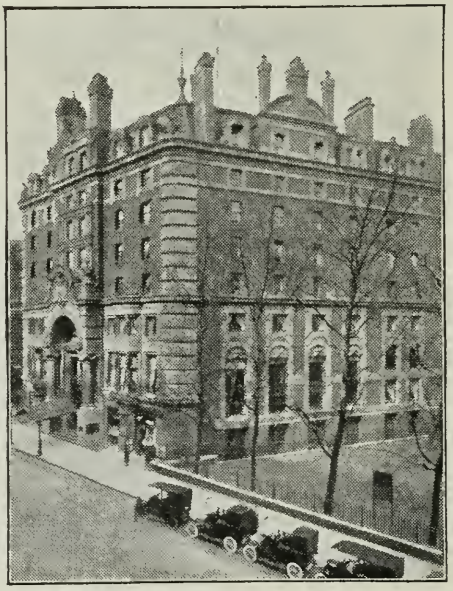

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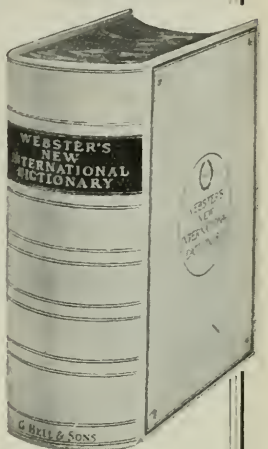

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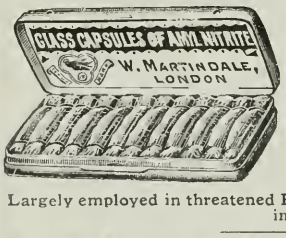

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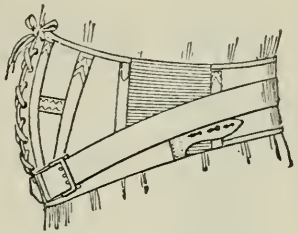

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By constant revision we have tried to make every article concise without omitting any necessary fact; we have also, by printing upon a fine thin paper, reduced the bulk and weight to a minimum. An examination of the present volume affords evidence that the workers in every department of medical science are making great advances, and also that the large proportion of the Profession are determined to keep themselves in touch with new knowledge, and to give expression, by practical application, to those fundamental principles which have been brought to light during recent years. We feel that our increasing popularity is due less to our own merit than to the growing keenness of the practitioner of to-day to be ever a learner. Otherwise it would not be possible for a fully illustrated work of this size to be published at so small a price.

Our business is to provide the reader with the information he requires, and to obtain it from the best source. We have never ignored a request for an

article dealing with any special point. It is because the *Annual* has been built up on these lines that it meets the purpose it was intended to serve.

Some of our readers have found a difficulty in the many new words that have been introduced into medical literature during recent years, and have suggested that we should add a glossary of new terms. We have made a beginning in this volume, and intend to add to it yearly. It will be found at the beginning of the reading matter *facing page* 1. Additions to our terminology are plainly necessary before we can accurately describe disease or express the differences in the effects we wish to produce by the therapeutic agents at our disposal.

We trust that this volume will receive the kind reception given to its predecessors; we know that all concerned with its production have tried to deserve it.

THE EDITOR.

The Medical Annual Offices,
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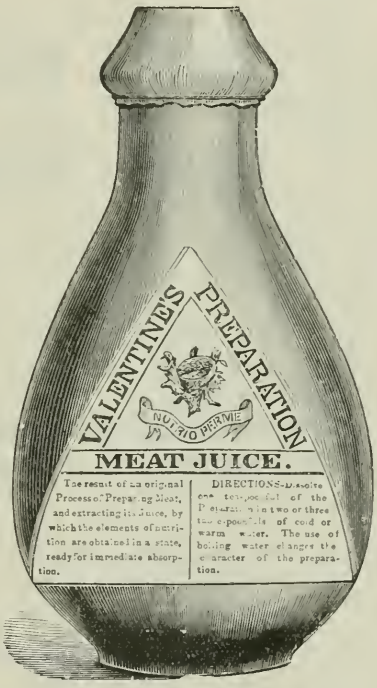
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GLOSSARY

Containing most of the newer terms in the present volume. Additions will be made annually.

Achlorhydria.—Absence of hydrochloric acid from the gastric secretions.

Activator.—A physical or chemical agent which renders active some other chemical agent. In medicine the term is applied almost exclusively to biochemical reactions.

Agglutinin.—A substance which has the power of agglutinating such cells as bacteria or red blood corpuscles. This power is usually specific, i.e., for each kind of cell there is a specific agglutinin, a principle utilized in the Widal test for typhoid fever. In **iso-agglutination** the reaction is wider, the agglutinin proving more or less active with all bacteria belonging to a certain group.

Allergy.—The altered reactivity of an infected animal or person to a second infection with the same poison.

Amboceptor.—A substance which has the specific power of binding complement (q.v.) to the cell (or bacterium) for which it (the amboceptor) is specific.

Anaphylaxis.—A specific susceptibility which may be manifested by an animal or person in response to a second injection of an organic substance the first injection of which was followed by no toxic results. The animal showing such acquisition of susceptibility is said to have become **sensitized** to that particular substance (see also **Allergy**).

Antigen.—Extract of bacteria or of tissue used in that class of serum test of which the Wassermann reaction is the chief, and which is based on the "fixation of complement" process. The complement (q.v.) is "fixed" by the union of the antibody or amboceptor (q.v.), to which it is attached, with the antigen, i.e., to the extract of bacteria or tissue for which that amboceptor is specific.

Autogenous.—As applied to bacterial vaccines, this adjective denotes those vaccines which are made from the patient's own micro-organisms, as opposed to "stock" vaccines, which are made from standard cultures.

Bacteriolytic.—That which dissolves bacteria.

Coliform. — An adjective denoting those micro-organisms which resemble B. coli communis

Complement.—A substance present in blood serum, possibly of ferment nature, which when linked by an amboceptor to a cell, constitutes with that amboceptor an agent capable of acting upon the cell. "The cell is the lock, the amboceptor the key, and the complement the hand that turns the key."

Diadokokinesis.—The performance of a rapid succession of alternating movements, e.g., pronation and supination.

Hæmolysin.—A substance possessing the power of dissolving red blood corpuscles and liberating their hæmoglobin: if possessing this property in regard to the corpuscles of all animals of a certain group or species it is called an **isohæmolysin.**

Herpetomonas.—A species of protozoon.

Hyperchlorhydria.—Excessive secretion of hydrochloric acid by the stomach.

Hypertonic.—As applied to saline solutions, the adjective denotes those which contain a higher percentage of salt than normal human blood serum.

Iontophoresis.—The introduction of ions into the body by the electric current, for therapeutic purposes.

Leucopoiesis. — The formation of leucocytes.

Lipoclastic.—Fat-splitting.

Lymphopenia.—Deficiency of lymphocytes.

Meiostagmin reaction.—A test used in the diagnosis of cancer, based on the estimation of interaction between antigen and antibody by measurement of the surface tension of a mixture of the two.

Metreurynter.—An instrument for artificial distention of the uterine cavity, e.g., a Champetier de Ribes' bag.

Opotherapy.—The use of extracts of normal animal tissues as therapeutic agents.

Opsonic Index.—The ratio between the phagocytic power of the blood serum of a normal individual, and that of an infected individual, in relation to the micro-organism with which the latter is infected.

Phlebotomus Fever. — A three-day fever met with in the countries around the Mediterranean, also in India, conveyed by sand-flies.

Pleomorphic.—Varying in form (applied to bacteria).

Polynucleosis. — Polymorphonuclear leucocytosis.

Sensitization. — (See **Anaphylaxis,** above).

Spirillicidal.—That destroys spirilla or spirochætes.

Thyrotoxicosis.—Poisoning by thyroid secretion.

Trypanocidal.—That destroys trypanosomes.

THE MEDICAL ANNUAL

Part I.—The Dictionary of Materia Medica and Therapeutics

REVIEW OF THERAPEUTIC PROGRESS, 1912.

BY

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GENERAL REVIEW.

Probably the most important therapeutic advance during the period under review has been the introduction of neosalvarsan. Many of the difficulties associated with the administration of salvarsan have been removed by the introduction of a soluble salvarsan compound, which forms neutral solutions.

In pituitrin we seem to have discovered a drug which is likely to prove of real use in obstetric practice. The favourable preliminary reports of last year have been amplified and almost unanimously confirmed by numerous clinical observers, who have since tested the drug on a large scale. It seems to be universally agreed that in the later stages of labour it exerts a powerful effect in producing strong uterine contractions, and already pituitrin has been hailed as the sovereign remedy for secondary inertia of the uterus.

Of the drugs introduced during the past year not much need be said. The most promising seems to be luminal, which has a powerful hypnotic and sedative action, though even a limited trial has shown that it is by no means free of important side actions.—[F. J. C.]

DICTIONARY OF REMEDIES.

ADALIN. (*See also* Heart Diseases *and* Insomnia.)

The relative harmlessness of this hypnotic has been shown by the records of observers who have studied the effects of very large doses taken accidentally or intentionally. Raschkow[1] saw a case where six tablets (3 grams) had been taken by mistake. Except for a sleep lasting forty hours, no unpleasant effect was produced. Fromm[2] saw a case where 4·5 grams were taken at one dose with suicidal intent.

The patient was not badly affected. After sleeping soundly all night, the only effect next day was a deadly-tired feeling. Von Hueber's[3] patient took 9 grams, but apart from a thirty hours' sleep experienced little inconvenience except for muscular weakness lasting for a couple of days. In this case, however, the full effect of the drug was avoided by energetic treatment with purgatives, etc. The most recent report is by Glombitza,[4] who, during a very searching clinical investigation of the hypnotic and sedative action of the drug, noted three cases where apparently a toxic action was produced. In six cases who had taken 3 grams daily for ten days, he noticed slight motor inco-ordination and lack of appetite. In another case he noted loss of appetite and severe diarrhœa ; the patient remained for two days in a condition of half sleep ; there was no alteration in the eye reflexes, but the cutaneous reflexes were diminished. On stopping the drug, the symptoms passed off in two or three days, and after eight days the adalin was resumed in small doses without reproducing the former condition. Another patient suddenly collapsed and became weak, and lost all power of will. The reflexes generally were depressed. The muscular weakness lasted seven days. The third patient, while taking 3 grams of adalin daily, was noticed on the fifth day to be very lethargic, with loss of will power, and in a state of partial sleep, refusing food, etc. If roused she relapsed almost immediately into sleep. In none of the cases was there any rash, and all recovered on stopping the drug for a few days. It is suggested that the drug is irregularly absorbed, and that this may explain the occasional development of such toxic states. This writer recommends the combined use of paraldehyde and adalin in cases of slight or moderate **Excitement.** Adalin also acts well when used along with the prolonged hot bath. One of the chief objections to the drug is the high price, which, with the large doses required, makes it somewhat costly.

In maniacal or excited conditions, König[5] found it very unreliable, but in depression, even with hallucinations, its action was more certain. He would, therefore, restrict its sedative action to **Depressed States.** As a hypnotic he finds it very satisfactory, but states that usually a fairly large dose is required, about 1 gram in 80 per cent of his cases. In this quantity it rapidly induces sleep, which is not attended or followed by any unpleasant features. Juliusburger[6] finds that the administration of adalin in **Morphinism,** with or without small doses of trional, is very useful in tiding the patient over the unpleasant sensations and restlessness which follow the sudden cutting off of morphine.

References.—[1]*Deut. med. Woch.* 1911, No. 49 ; [2]*Ibid.* No. 45 ; [3]*Münch. med. Woch.* 1911, No. 49 ; [4]*Ibid.* 1912, 307 ; [5]*Berl. klin. Woch.* 1911, 1835 ; [6]*Deut. med. Woch.* 1911, 1989.

ADRENALIN.

Januscu and Pollak[1] have investigated the action of adrenalin upon the tissue of the lung. As the result of their experiments they conclude that the antagonism existing between adrenalin and muscarin depends

upon the fact that adrenalin relaxes muscular spasm. Since adrenalin relieves **Asthma,** it is probable that the attack depends not upon vascular spasm, but upon a muscular constriction. It seems probable that the asthmatic disturbance in failure of the circulation, nephritis, and emphysema, also depends upon muscular spasm, since adrenalin gives relief.

Reference.—[1]*Arch. f. Exper. u. Path. Pharmak.* 1911, lxvi, 205.

AGAR.

Max Einhorn[1] finds agar a useful vehicle for administering intestinal remedies. An agar-containing preparation slowly absorbs water, and then liberates the drug by osmosis, so that a large area of the intestine is subjected to its action. Its property of retaining fluid and so increasing the bulk of and softening the fæces, makes it especially valuable for exhibiting remedies in **Constipation.** Similarly, in **Diarrhœa,** agar may be of value in overcoming the tendency of astringent remedies to produce too hard scybala. To impregnate agar, the medicinal agent is first dissolved in a boiling solution of agar and then evaporated, dried, and ground up into flakes. Useful preparations are the following (in each case the quantity of active drug in one teaspoonful is stated): Phenolphthalein-agar, gr. ½; rhubarb-agar, 16 min. of ext. rhei. fluid. (U.S.P.); calumba-agar, 32 min. ext. calumbæ fluid.; catechu-agar, 32 min. tinct. gambier co. (U.S.P.); tannin-agar, gr. ½. Phenolphthalein-agar and rhubarb-agar can be conveniently used for the different varieties of constipation, the average dose being one teaspoonful twice daily after breakfast and supper. Calumba-agar has proved valuable in cases of **Colitis** where defæcation is normal but much mucus appears in the stool. The catechu and tannin preparations are valuable in **Diarrhœa,** the average dose being one teaspoonful thrice daily after meals.

Reference.—[1]*Amer. Jour. Med. Sci.* 1912, i, 230.

ALCOHOL.

Marquis[1] recommends alcohol as the best *antiseptic* for the hands of the surgeon. It is used alone, without any preliminary cleansing with soap and water, which only interferes with its action. The most suitable form to use is a highly concentrated alcohol. The purest alcohols are the most effective bactericides, as they are the most toxic and penetrate more surely into the skin. The sterility obtained by washing the hands with towels moistened with alcohol, is more certain than that obtainable by other methods, and lasts for at least fifteen minutes in unfavourable, and thirty minutes in favourable, conditions. To obtain a good disinfection of the hands it is necessary to scrub them with sterile gauze impregnated with alcohol for six to ten minutes.

Reference.—[1]*Rev. de Chir.* 1912, 296 and 487.

ALEUDRIN.

Aleudrin is a new *hypnotic* and sedative, the chemical and pharmacological properties of which have been investigated by Maass.[1] In an investigation on the hypnotic action of chlorine compounds of alcohol, he combined various chlorized alcohols with urea as carbamic acid esters. All such compounds investigated had marked hypnotic properties, but many of them acted deleteriously on the respiration and circulation. The most promising was the ester of carbamate of α-dichlorisopropyl-alcohol, which possesses marked hypnotic properties without any depressing action on other functions. Its chemical formula is

$$\begin{array}{l} CH_2\text{–}Cl \\ | \\ CH\ \text{–}OCONH_2 \\ | \\ CH_2\text{–}Cl \end{array}$$

It is a white crystalline substance without any odour. It dissolves readily in alcohol, benzol, chloroform, ether, acetone, glycerin, and fatty oils, but is very sparingly soluble in water. However, in a watery solution of glycerin (2 per cent), on heating, aleudrin dissolves to the extent of 2 per cent. Animal experiments show that the new drug is a good hypnotic, the toxic being much larger than the hypnotic dose. Investigation of the action of the drug on the isolated organs shows that it has little on the heart, or on the temperature. In man the drug also acts well. The dose of 0·5 gram causes usually a feeling of quiet and a distinct lessening of any pain which may be present. One gram causes a sleep lasting several hours, followed on awakening by no unpleasant after-effects. Probably with larger doses the drug will act even in the presence of pain. In one case a man took 3 grams, and slept for eight hours without any unpleasant effect on awakening.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 1231.

ALLANTOIN.

Macalister[1] has drawn attention to the common comfrey (*Symphytum*), as an application for wounds, confirming the claims of the old-time writers. Either as a strong infusion or as a simple extract of the root, the drug seems to aid the healing of wounds. Subsequently, at the request of Macalister, the drug was chemically investigated. Titherley and Coppin[2] found that it contained about 0·8 per cent of allantoin, and subsequent clinical tests by Macalister and others[3] show that allantoin is the active principle on which the cell-proliferant action depends. Though allantoin is an expensive substance, the clinical use of the drug is not costly, as it can be used in a 0·3 to 0·4 per cent watery solution. These solutions applied to open **Ulcers** or **Wounds** cause rapid formation of epithelium, and **Sinuses** also heal up readily. Macalister[4] points out that allantoin when injected into hyacinths, crocuses, snowdrops, and other bulbs, induces abnormally rapid growth of the flower, while the growth of the leaves is not stimulated.

REFERENCES.—[1]*Liverp. Med.-Chir. Jour.* 1912, 65; [2]*Brit. Med. Jour.* 1912, i, 10; [3]*Ibid.* 12; [4]*Ibid.* 102.

ANILINE DYES.

Sachs[1] noted that in workers who had to keep their hands in contact with various aniline dyes, skin changes of a papular or papular-warty character were induced. He accordingly investigated the result of applying a series of aniline dyes to the skin, and found that they all produced typical lesions, consisting histologically in an increased width and proliferation of the rete malpighii, and increase in the sebaceous glands. A control series of experiments with other dyes not belonging to the aniline group, gave negative results. Similarly, he found that the subcutaneous injection of many aniline compounds produced in the rabbit's ear changes identical with those got by Fischer with scarlet red. Therapeutically he found them as efficacious as scarlet red, when used as ointments to facilitate the epithelialization of granulating **Wounds, Ulcers,** broken-down **Gummata,** etc.

REFERENCE.—[1]*Wien. klin. Woch.* 1911, 1551.

APONAL.

Yonge[1] speaks highly of aponal. Chemically it is the ester of tertiary amyl alcohol, i.e., amylene-hydrate carbamate, $NH_2.CO.OC(CH_3)_2.C_2H_5$, formed by the action of urea chloride on amylene hydrate. It is administered in tablet form, as it is insoluble in water. It is a mild hypnotic which, in doses of 15 to 30 gr., acts rapidly, inducing a light calm sleep within half an hour. There is no undesirable after-effect. It is not suitable for sleeplessness due to pain.

REFERENCE.—[1]*Med. Press and Circ.* 1912, i, 648.

ARSENIC.

Klocman's[1] experiments show that arsenic given before meals causes hypersecretion of the gastro-intestinal fluids. Antipyrin has the same effect. On the other hand, sodium salicylate, quinine, and iron lactate diminish secretion.

REFERENCE.—[1]*Ziet. f. Phys. Chem.* 1912, Aug., 17.

ARYLARSONATES.

White and Woodall[1] find that in mice inoculated with Jensen's tumour the administration of arsacetin and atoxyl is not curative, but apparently retards slightly the growth of the tumours. In some investigations on human patients, Woodall[2] found that arsacetin or atoxyl in cancerous conditions increased the acidity of the urine, and the phosphates in a form other than calcium phosphates. It has previously been shown that in the serum of cancerous patients, the basicity is slightly increased and urinary excretion of phosphates diminished. He thinks, therefore, that atoxyl and arsacetin, by increasing the acidity of, and the excretion of phosphates in, the urine, may exert a favourable influence on the body fluids of cancer patients, as numerous investigations show that on tadpoles and larvæ of the sea urchin, a slight increase in alkalinity favoured growth.

REFERENCES.—[1]*Med. Chron.* 1912, ii, 185; [2]*Ibid.* 192.

ASPIRIN.

A soluble form of aspirin has been prepared as the calcium salt of acetyl-salicylic acid. It is a tasteless substance which dissolves readily in water. It must be freshly prepared, as after standing for several hours the solution becomes slightly acid from the liberation of acetic acid. Görges[1] states that the new salt has all the therapeutic value of aspirin, while it is much more easily administered to children.

REFERENCE.—[1]*Deut. med. Woch.* 1911, 1605.

BERBERINE.

Waugh[1] believes that berberine, given in small doses for a prolonged period, has the property of inducing contraction of relaxed connective tissue, and advocates it in **Malarial Enlarged Spleen**; and in **Gastroptosis, Displaced Kidney, Prolapsed Uterus,** and **Dilatation of the Stomach** and **Bowels,** along with mechanical support. He gives the drug in doses of 1 to 3 gr. for not less than six weeks. In animals, the intravenous injection of berberine produces a uterine action, the contractions being made more powerful without any tendency to continuous spasm. Marek[2] has recently used the drug in **Labour.** In eight out of fifteen primiparæ, a successful action was obtained, the pains becoming more forcible and effective. In six cases it failed. The drug was not so effective in multiparæ, as only two out of six reacted satisfactorily. Marek finds that the drug acts with especial energy where there are painful but ineffectual contractions of the uterus, accompanied by violent sacral pain, and when the pains are regular. It does not seem so constant in action as quinine, but the dose he employed (4 gr.) followed at intervals of ten minutes by two doses of 1½ gr., may have been too small.

REFERENCES.—[1]*Med. Rec.* 1912, i, 571; [2]*Sem. Méd.* 1911, 484.

BOLUS ALBA.

Liermann[1] states that this substance is a most satisfactory dressing for **Wounds,** owing to its power of absorbing moisture, and also a slight astringent property which checks secretion. He employs a special paste containing, in addition to kaolin, some 96 per cent alcohol, glycerin, and azodermin (one of the scarlet-red products which promote the epithelialization of wounds). For open wounds only a small amount is required, as too much causes some irritation and smarting. The paste is also useful in dermatological treatment. The preparation is specially sterilized, and the powder is in the finest state of subdivision. To ensure absolute safety before being put upon the market, each batch of paste is tested for tetanus spores by inoculation into animals.

REFERENCE.—[1]*Deut. med. Woch.* 1911, 1829.

BROMIDES AND IODIDES.

Sarvonat and Crémieu[1] have been able to show that with administration of iodides and bromides, the absolute amount of these alkalies stored up in the viscera and brain is greatly increased when dogs are

fed with a diet poor in chlorides. They conclude that in such circumstances the iodine and bromine are substituted in the tissues for the chlorine. Consequently they hold that a chloride-free diet is advantageous when it is desired to produce an intense iodide or bromide action.

REFERENCE.—[1]*Rev. de Méd.* 1911, 762.

CALCIUM.

Hirschberg[1] has treated a number of patients suffering from articular diseases with a diet deficient in calcium. He finds that in a certain proportion a notable degree of improvement is obtained both in the mobility of the joints and in the relief of pain, but not every type responds. Those patients who show a deficient urinary excretion of calcium are most likely to improve. Consequently he advocates a test period to determine the patient's power of utilizing calcium. For three days the patient should be put upon a diet containing a known quantity of calcium, and the excretion of calcium in the fæces and urine be determined. A suitable diet consists of one litre of milk, 200 grams of aleuronate bread, honey, and Selter's water made with distilled water, 200 grams rice and water, with 300 c.c. of a bouillon made with 25 grams meat extract and 275 c.c. calcium-free water, and 100 to 150 grams of scraped beef. To this may be added margarine or vegetable butter substitutes, honey, and aerated water made with distilled water. Such a diet contains only about 1·8 gram of calcium derived almost entirely from the milk. Patients suffering from joint troubles who, resting in bed and taking the test diet for three days, excrete in the urine only 10 per cent and less of the ingested calcium, are suitable for calcium-free dieting. If for any reason it is impossible to carry out this metabolism test, the calcium-free diet is worth trying in **Chronic Vertebral Ankylosis, Arthritis Deformans** with a tendency to ankylosis of the joints, and in the **Joint Pains** which sometimes follow acute polyarthritis. This reduction of calcium in the dietary is, however, always a serious step, and careful control of urinary excretion and of the body weight is required. In carrying out the calcium-free diet the following articles are utilized : aleuronate bread, rice, white bread, sago, ground rice, cornflour, tomatoes, mushrooms, oatmeal, white of egg, meat soups, meat extract, beef, fowl, calves' liver, tongue, all foodstuffs rich in sugar, honey, and jams ; for fatty material, the various vegetable butter substitutes ; for fluids, aerated waters made with distilled water, white beer, port wine, and champagne. As a rule the diet can be maintained for six to eight weeks, when a less strict diet may be allowed, from which, however, milk butter, yolk of egg, potatoes, and spinach, are absolutely excluded, and other forms of vegetables are restricted as much as possible.

REFERENCE.—[1]*Berl. klin. Woch.* 1911, 2056.

CAMPHOR.

Seibert[1] states that he has found injections of large doses of camphor dissolved in oil to be of value in the treatment of **Pneumonia.** Out of thirty-seven cases so treated only one succumbed—a man, aged

sixty-eight, with fatty degeneration of the heart. At first he employed 12 c.c. of a 20 per cent solution every twelve hours in adults, and 6 c.c. in children. The beneficial results were shown in gradual reduction of the toxæmia, until practically normal conditions were reached three or four days after the first injection. There was in no case a crisis. He believes that these doses are too small, as in four of his cases complications arose: nephritis in two, and empyema in two. He found that camphorated oil injections had a very distinct effect upon the infection produced by injecting pneumococci into rabbits. He therefore used larger doses in the treatment of human pneumonia. He states that hypodermic injection of 10 c.c. of a 30 per cent solution of camphor in sesame oil for each 100 grams of body weight, every eight to twelve hours, produces no symptoms of poisoning, and is in fact harmless. The injections are made along the outer thigh into the tissue below the subcutaneous fat.

REFERENCE.—[1]*Med. Rec.* 1912, i, 750.

CARBO ANIMALIS.

According to Adler[1] the internal administration of large doses of animal charcoal is a useful therapeutic measure in the treatment of gastro-intestinal conditions arising from the presence of irritating or toxic substances in the bowel or stomach. This depends on the fact that charcoal is able to absorb almost instantaneously soluble toxins and many alkaloids. Consequently the cause of the gastro-intestinal irritation is removed and the symptoms promptly subside. It follows from this explanation that charcoal is not likely to be of any use where the symptoms depend on anatomical changes in the tract. It acted best in **Gastro-intestinal Irritation** due to **Abnormal Fermentation** in the bowel, and in a couple of cases of **Diarrhœa** in **Diabetics.** It does not cause constipation. The drug is given in 5-gram doses twice or thrice daily, suspended in a glass of water. It has no particular taste, and apart from its appearance is not difficult to take. It diminishes the putridity of the stools and seems also to lessen their bacterial contents. Adler points out that it is well worth remembering that in cases of poisoning with vegetable alkaloids, the washing out of the stomach with a suspension of animal charcoal is likely to prove of great value.

REFERENCE.—[1]*Wien. klin. Woch.* 1912, 788.

CHOLOGEN.

Engelen[1] reports a case of **Ascending Cholangitis,** due probably to infection of the stagnated bile with *B. coli,* which reacted surprisingly well to chologen. In discussing how this combination of calomel, podophyllin, and aromatic substance acted, he states that neither the purgative nor the antiseptic action can alone explain the good effect. He is inclined to think that small doses of mercury act upon the liver through the nervous system. He points out that very

frequently cholangitis and gall-stone colic result from some cause producing mental perturbation. The liver under these conditions passes abnormal bile, which may be either deficient in antiseptic power or perhaps chemically irritating to the passages. Apparently, he holds that mercury in small doses can act upon the liver through the nervous system and produce a healthy bile.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 511.

CODEONAL.

A combination of the diethylbarbiturates of codeine and sodium has recently been introduced as a narcotic and hypnotic. Bürgi thinks that if the two substances are closely allied chemically, and therefore presumably act on the same cellular structures, a summation of the narcotic action is obtained; but if the drugs are not chemically allied, by acting on different portions of the cellular structures, two different actions may be obtained which may result in a deeper narcosis, i.e., an intensified action. This principle has often been applied, as in the administration of small doses of various hypnotics before the inhalation of chloroform, and the combination of morphine and hyoscine to produce surgical anæsthesia. Unlike most alkaloids, codeine forms a crystalline compound with diethylbarbituric acid containing 63 per cent of codeine. As it is considered that this compound contains too little diethylbarbituric acid to produce a hypnotic action, it has been thought advisable to mix additional veronal (sodium diethylbarbiturate). Bachem[1] advises a mixture of one part of the codeine salt with five parts of sodium veronal. The mixture, codeonal, contains 11·76 per cent of codeine diethylbarbiturate and 88·24 per cent of sodium diethylbarbiturate, i.e., 2 – 15 parts. It is sold in sugar-covered tablets which are slightly flavoured with oil of peppermint. Bachem claims that the combination of codeine and veronal removes some of the undesirable effects of veronal, especially its tendency to produce a fall of temperature. Beyerhaus[2] has used codeonal clinically in sleeplessness. He states that it is useful in mild degrees of insomnia occurring in mental disease, but is not so reliable as trional, chloral, or veronal. It frequently failed in the sleeplessness of very excited mental patients. He finds that it is very useful where the sleeplessness is caused by pain, reflex cough, or other forms of bodily discomfort. It did not prove of much effect as a sedative in mental cases. The tablets contain 0·17 gram codeonal, i.e., 0·02 gram cod. diethyl. and 0·15 gram sodium veronal. The average hypnotic dose is one to two tablets. Gaupp,[3] from his experience with sixty cases such as occur in medical wards, states that codeonal seems to act with greater certainty than other known hypnotics with the exception of morphia. It is specially useful when the sleeplessness is due to pain of a mild character, reflex cough, or breathlessness. He finds it useful in the management of **Tuberculosis of the Larynx and Lungs.** As a rule, sleep is induced within half an hour, and lasts about six to seven hours.

Stursberg[4] finds that, as contrasted with codeine phosphate, codeine diethylbarbiturate is rather more powerful as a hypnotic, and also seems to be more sedative to the respiratory centre.

References.—[1]*Berl. klin. Woch.* 1912, 260; [2]*Deut. med. Woch.* 1912, 405; [3]*Berl. klin. Woch.* 1912, 306; [4]*Münch. med. Woch.* 1912, 983.

COD-LIVER OIL.

Williams[1] points out that cod-liver oil differs from the ordinary fats of food. It contains very little phosphatide, and when prepared in an atmosphere of CO_2 is almost entirely composed of unsaturated fats, being thus comparable to the fats prepared in the liver for the immediate needs of the body. The beneficial action of this oil on metabolism (increased fat absorption and retention of nitrogen) probably depends on the splitting up of the stable glycerides of these unsaturated fats into very active free acids. The method of preparation of the oil seems of importance. When precautions (such as an atmosphere of CO_2) are taken to prevent oxidation processes, the oil contains more unsaturated fat, and is freer from taste and impurities. It is possible that, in addition to their metabolic effect, the unsaturated fats may exert some action on tubercle bacilli, since the growth of these is inhibited by the presence of unsaturated fatty acids, and cod-liver oil *in vitro* dissolves the fatty envelope which surrounds the tubercle bacillus.

Reference.—[1]*Brit. Med. Jour.* 1912, ii, 700.

CORPUS LUTEUM.

Jaeger[1] finds an extract of corpora lutea of distinct value in the treatment of disturbance to the general health arising from the **Menopause**, whether natural or artificially induced. The results obtained in fifty-one cases are shown in the following table:—

Type of Case	No. of Cases	Cured	Improved	No Effect	Worse
One ovary removed	11	6	2	3	—
Both ovaries removed	9	4	2	1	2
Natural menopause	14	6	2	5	—
Ovarian disease, no operation ..	17	5	2	10	—

In the last group none were absolutely cured, but the condition was decidedly improved in five cases. The dose was always 5 gr., three times daily. The action was as follows: Within a few days vascular congestion to a greater or less extent was produced, and usually disappeared after a state of tolerance had been reached. In some cases decided flushing of the face occurred. In two cases tinnitus aurium, and in fourteen cases dizziness, were noted. In one case tachycardia necessitated stopping the drug. In seventeen cases the pulse-rate rose from 80–90 to 110–132. The general health usually improved as regards appetite, sleep, etc.

Reference.—[1]*Ther. Gaz.* 1912, 461.

COUNTER-IRRITATION.

Midelton[1] claims that continuous counter-irritation gives remarkable results in various chronic diseases. In **Rheumatoid Arthritis** he applies a blister, 4 in. by 1½ in., as nearly as possible on each side alongside the cervical enlargement of the spinal cord. When the blister has risen well, the skin is removed and the raw surface dressed with savin ointment spread on lint. Another favourite method of inducing continuous counter-irritation is by acupuncture, the needle punctures being immediately painted with the following solution, which he uses in the most varied chronic or acute diseases.

R	Olei Crotonis	℥j	Acidi Acet. Fort.	℥j
	Cantharidini	gr. iij	Olei Amygd. Dulc.	ad ℥viij

Thus he claims that it has given relief to troublesome symptoms in **Cancer of the Liver, Eczema, Multiple Neuritis,** and **Gastritis.** In **Asthma** and **Migraine** the relief has been most gratifying, the paroxysms being permanently modified in all cases, and in some a practical cure effected. In chronic **Diseases of the Spinal Cord** the results have been encouraging; pain has been modified or banished, spasticity lessened, ataxy overcome, coldness of the limbs abolished, etc. In **Skin Diseases** the treatment is practically specific, and in **Brachial Neuritis** and **Sciatica** great improvement or cure has taken place. There is a remarkable return of muscular power. While unable to speak with certainty as to how these remedies act, he suggests as a working theory that all infections linger indefinitely and account for the progressive nature of such diseases as arthritis deformans. If the lingering germs can be lessened in number or attenuated in virulence, the patient will improve. Counter-irritation will do this. Hyperæmia and exudation may be produced in any part of the body, and thereby a profound physiological effect on muscle or spinal cells. The treatment may be kept up for years.

REFERENCE.—[1]*Med. Press,* 1912, i, 484.

DIGALEN (Amorphous Digitoxin).

Symes,[1] in experiments on animals, shows digalen to be an active preparation, producing characteristic digitalis effects on the circulatory system and on the secretion of urine. Benjamin Moore[2] found it much less toxic for the frog and rabbit than tincture of digitalis. In rabbits, the tincture is about three to four times as toxic as digalen. On perfusion through the isolated mammalian heart, a marked digitalis action is got, i.e., slowing, and increased tonus and force, but in such perfusion experiments no equilibrium is established, the heart continuing to absorb the drug till it is eventually poisoned. This occurs even if the digalen solution is diluted 1–500 in Ringer's solution. On the other hand, a rabbit of two kilos in weight can be given 3 c.c. intravenously and will recover to normal in about two days, though this represents a dilution of only 1–70, taking the blood volume as equal to one-tenth the body weight. The

reason is that when blood-serum is the circulating medium, an equilibrium is established between the serum and the heart muscle, which remains steady till the drug is excreted. The "*co-efficient of distribution*" of the drug between serum and heart muscle is a comparatively low one, a point being soon reached at which no more of the drug will pass from the serum into the heart muscle. This physico-chemical basis determines the toxicity of cardiac drugs: a high co-efficient of distribution means a low margin of safety, rapid accumulation in heart muscle, whereas a low co-efficient means a wide margin of safety between the therapeutic and the toxic dose, and little tendency to accumulation in the heart muscle. Moore believes that digalen is preferable to a mixture of glucosides differing in action, such as occurs in Galenical preparations of digitalis. In using digalen a full therapeutic dose should be aimed at, and thereafter the drug should not be pushed further, but just enough be given to maintain the advantage by keeping pace with the elimination of the drug. Soluble digitoxin shows none of that hæmolytic action on the blood corpuscles possessed by the sapo-glucosides which act on the heart, e.g., the digitoxin present in ordinary tincture of digitalis. Unlike the latter, digalen can be safely given intravenously.

References.—[1]*Brit. Med. Jour.* 1911, ii, 1346; [2]*Ibid.* 1912, i, 60.

DIGITALIS. (*See also* Auricular Fibrillation *and* Heart Diseases.)

Goodall,[1] from examination of freshly-prepared samples of tincture of digitalis made by chemists of repute, found that nearly half of them showed a departure from the standard of potency, i.e., that 3 mins. should kill a male frog weighing 20 grams within four hours. Out of twenty-three samples, twelve were of average potency, while five were over strength and six under strength. The variations were considerable—from 275 per cent over to 40 per cent under strength. He finds that up to one year the tincture probably retains its full activity, but thereafter deterioration of its potency to an important extent is likely to take place.

Moran[2] has investigated the action of digitalis tinctures made from various parts of the plant. The method employed was to perfuse the frog heart from the vena cava inferior. The contractions were recorded graphically, and the test consisted in determining the amount of the drug required to be perfused to produce systolic arrest of the heart. The tinctures were perfused in a 4 per cent strength in Ringer's solution. The chief advantage of this method is that it is possible to differentiate between the characteristic tonic action resulting in systolic arrest, and a saponin action without any tonic action. Tinctures from the fresh root do not show the desired tonic action. Those made from seeds possess some activity resulting in a tonic action, acceleration of beat, and systolic arrest. If the tincture is made from defatted seeds, only a tonic action with very little slowing is obtained. There is no systolic arrest. Moran considers that these tinctures are quite inactive as regards a characteristic digitalis action,

though possibly they may be of use clinically where it is desired to increase the tone of the heart's action without any slowing of rate. On the other hand, the flowers of digitalis contain large quantities of digitoxin, and tinctures of the flowers are more active than tincture of the leaves. The use of flowers as the source of the tinctures might be of advantage, as it would be less easy to adulterate them ; and as the plant flowers only biennially, it would be impossible to use immature plants.

The keeping properties of various tinctures of the leaves were also investigated. The general conclusion come to was that a tincture made by a reliable firm of chemists, from carefully dried leaves of good quality, should retain its activity for two or three years. Tinctures made in 1905 and 1906 gave a good tonic action, but the slowing properties have diminished. This probably indicates decomposition of digitoxin. All these tinctures were strongly acid, and Schmiedeberg has shown that in acid solution digitoxin decomposes. A tincture made twenty-seven years ago, and one made in 1911 from an extract of digitalis nineteen years old, gave only a saponin action.

Worth Hale[3] has tested the effect of the digestive secretions on the activity of digitalis and allied drugs. He finds that the acid of the gastric secretion invariably causes some diminution in the action of the glucosides of digitalis and strophanthus. Perhaps the decomposition products may produce certain of the untoward results of digitalis medication. To minimize decomposition, he advises that the tinctures should be neutral in reaction, and should be given with an alkali between meals, when the gastric acidity is less marked.

In a critical review of the various digitalis preparations used in medicine, Dixon[4] states that pharmocological and clinical investigations have not made a clear case for the substitution of " active principles " for Galenical preparations of digitalis in the treatment of patients. The active principles are just as irritant as the infusion and tincture, and are not more reliable or constant in action than a properly standardized tincture, nor are they absorbed more rapidly, while they have the same tendency to accumulate, and are all more expensive. The one advantage they possess is that they may be given intravenously without ill effects.

References.—[1]*Brit. Med. Jour.* 1912, i, 887 ; [2]*Med. Chron.* 1911, Oct., 1 ; [3]*Jour. Amer. Med. Assoc.* 1911, ii, 1515 ; [4]*Quart. Jour. Med.* 1912, Jan., 297.

DIORADIN. (*See also* Pulmonary Tuberculosis *and* Tuberculosis, Surgical.)

Bernheim, president of the French department for dealing with human tuberculosis, has strongly supported the claim of the originator of dioradin that it has a beneficial action in human **Tuberculosis.** Dioradin is an oily liquid smelling strongly of menthol. It seems to contain menthol and radium-barium chloride, and according to Melville has some radio-activity. It is administered intramuscularly in doses of 1 c.c. daily for one month, followed by fifteen injections

at intervals of a day. Cecil Wall[1] has carefully tested the effect of this treatment upon a series of ten patients representing common types of the disease. The clinical results obtained were in no case such as to substantiate Bernheim's enthusiastic claims. The tubercle bacilli did not disappear from the sputa. In six cases improvement was noted, but in only one case was this maintained. In no case was there evidence of complete arrest of the disease. Seven patients gained weight at least temporarily. There was no definite evidence of local action.

Reference.—[1]*Brit. Med. Jour.* 1912, ii, 109.

ETHYL HYDROCUPREIN.

Morgenroth and Levy[1] publish some interesting experiments with ethyl hydrocuprein on animals infected with pneumococci. This substance is closely allied chemically to hydrochinin (methyl hydrocuprein) and quinine. Whereas quinine injected prophylactically about an hour before the infection of mice with pneumococci has practically no protective action, the next homologue of the series, hydrochinin, is more powerful, while ethyl hydrocuprein is still more protective. Subsequent investigation showed that this drug had not only a protective value when injected one hour before intraperitoneal infection, but also exerted a distinct curative action when administered up to five or six hours after it. Even when given so long as twenty-four hours after infection with a strain killing in forty-eight hours, the favourable effect is evident in a prolongation of life, though the animals eventually die.

Reference.—[1]*Berl. klin. Woch.* 1911, 1979.

FIBROLYSIN.

Oser[1] claims that a single intramuscular injection of fibrolysin cures **Tenosynovitis** within three or four days, whereas with the usual treatment with external application of iodine and rest, two to three weeks elapse before the cure is complete. He describes twenty cases successfully treated with fibrolysin.

Reference.—[1]*Wien. klin. Woch.* 1911, 1530.

FŒTAL AUTOLYTIC PRODUCTS.

Fichera[1] records interesting clinical results from the inoculation of homogeneous fœtal autolytic products in cases of **Malignant Tumours.**

The basis of his procedure lies in certain facts. In very young animals, spontaneous tumours are rare. Rats previously treated with injections of embryonic or fœtal tissues acquire resistance against inoculated malignant neoplasms. Injections or local applications of autolytic products of fœtal or embryonic tissue bring about destruction of the inoculated neoplastic elements. Hence these facts indicate that in the early epochs of life the factors necessary to the genesis of malignant tumours are wanting, and that a similar inhibiting action is

obtained from injecting the autolytic products of fœtal or embryonic tissue.

He has tested this theory in actual practice on inoperable cases of human malignant tumours, and claims that out of a series of 18 cases adequately treated, 5 were cured, 5 improved, and the remainder died. The autolysate is obtained by placing the fœtal fragments in physiological solution, of an average strength of 1 gram to 20 c.c., with a small quantity of phenol or thymol. The mixture is then covered with a layer of toluol or sterilized oil, and kept in an incubator at 37° C. for two months. The injections vary in dose from 2 to 3 c.c. two to four times weekly, according to the patient's age, condition, and tolerance, site of injection, mass of tumour, and specific gravity of the autolysate.

The results of the treatment are twofold. Injections into the tumour produce hæmorrhagic, necrobiotic, or necrotic areas, whereas injections into parts remote from the tumour produce cytolysis, with a moderate degree of substitutive connective tissue, and less hæmorrhagic and necrobiotic change. The macroscopic changes are : a diffuse cytolysis of the neoplastic cells, the elements breaking up and the morphological entity being lost ; intense infiltration ; penetrations of phagocytic cells ; active proliferation of connective and vascular tissue, and the gradual transformation of the tumour mass into normal adult connective tissue. Clinically, the morphological changes may be much more marked than the change in size of the tumour would lead one to expect. Local treatment takes longer to effect a cure than general treatment with remote injections, and leads to fibrous-tissue formation. Further, remote injections cause no general or local reaction, but direct local injections provoke intense reactions, with fever, rigor, and headache, and later, redness, hardening, and swelling of the tumour. When the neoplastic tissue has been absorbed, the local injections produce no more disturbance than the remote ones. When the tumour mass is small, remote injections may be used ; but with large tumours they only succeed in delaying the growth, and in such cases energetic local injection treatment is required.

REFERENCE.—[1]*Lancet*, 1911, ii, 1194.

FUCHSIN, BASIC.

May[1] believes that basic fuchsin (rosanilin acetate) is a more powerful **Germicide** than carbolic acid. A warm solution of 1–1000 is lethal in five minutes to *B. coli*, *B. typhosus*, *B. paratyphosus*, *B. dysenteriæ*, and *Staphylococcus pyogenes aureus*, while blastomycetes were not killed in less than fifteen minutes. Even more resistant were *B. tuberculosis* and *Oidium albicans*, which succumbed only to 1–100 solution in five minutes. Basic fuchsin is very diffusible and does not precipitate albumin. Its toxicity is not great. He believes that it has a marked stimulative effect upon the growth of epithelial and granulation tissue.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1174.

GELATIN.

It is recognized that gelatin is a sparer of albumin, though unable to replace it. It differs from albumin in containing many, but not all, of the amino-acids which are necessary for the cellular synthesis of protoplasm. Thus gelatin, along with a rich diet of carbohydrates and fats, is not able to keep an animal in nitrogenous equilibrium. Recently, Abderhalden and Lampé[1] have tested dogs to see if the addition of an ammonia salt to this diet will enable the animal to manufacture the missing amino-acids; but they find that this is not the case. The animals remained permanently with a slight nitrogenous deficit.

REFERENCE.—[1]*Ziet. f. Phys. Chem.* 1912, 136.

HEXAMETHYLENAMIN ("Urotropin," "Urisol").

Fullerton[1] reports a case of severe cystitis which followed the oral administration of hexamethylenamin. The woman was eight and a half months pregnant when she began to suffer from antral empyema. A week later the frontal sinus became involved. Two days before the sinus was opened, hexamethylenamin was administered, 40 gr. being given each day. This dose was increased to 60 gr. on the day of the operation, and on the evening of the following day. When she had taken 200 gr. in four days the bladder symptoms began. On the following day the hexamethylenamin was reduced to 45 gr., and helmitol in similar quantity was also given. The urinary distress was intensified. The urine was acid and contained pus and albumin. Blood and blood-clots with pieces of bladder membrane were passed, but no organisms. The culture proved sterile. On stopping the drugs and administering potassium citrate and hyoscyamus the symptoms gradually subsided, but hæmaturia persisted for ten days.

Prouty[2] records a case of severe **Orchitis,** secondary to an infection of the tonsils, which rapidly subsided within forty-eight hours of commencing treatment with hexamethylenamin in doses of 15 gr. every six hours. Sachs[3] has investigated the action of hexamethylenamin in **Skin Disease.** With doses of from 60 to 90 gr. daily, he has been able to demonstrate formaldehyde in the vesicles and pustules of herpes zoster, erythema multiforme, and erythema bullosum, and in the crusts of impetigo contagiosa. Clinically, he finds that the administration of the drug for a few days results in the inflammatory base of the lesions in erythema multiforme and herpes zoster being more accentuated, and possibly the course of the diseases was shortened. He thinks that an extended clinical test of the drug is indicated in those cutaneous diseases which lead to the formation of vesicles.

Zak[1] has demonstrated that after the internal administration of the drug, it is excreted not only by the saliva but also by the bronchial secretion. He suggests that the effect of the drug as a disinfectant of the sputum should be tested in **Ulcerating Diseases of the Lung** (tuberculosis, gangrene, bronchiectasis). It fulfils the theoretical desideratum that it is excreted locally by the organ which it is intended

to act upon. It appears to be excreted unchanged, but the addition of a small quantity of hexamethylenamin to sputum, in vitro, very effectually prevents the onset of putrefactive changes. He incidentally mentions that hexamethylenamin prevents fermentation of the contents of the stomach when there is pyloric stenosis.

Campbell Williams[5] finds that the clinical exhibition of helmitol (hexamethylenamin-anhydro-methylene citrate), with doses of potassium citrate not sufficient to alkalinize the urine, does not interfere with the utility of the drug as a urinary antiseptic in **Bacilluric Cystitis** and in the early stages of **Gonorrhœa.** Chemical investigation of normal urine under alkali and helmitol treatment, showed that it contained a minute trace of free formaldehyde. Artificial acidification of the same urine with acid sodium phosphate showed that there was no greater decomposition than in neutral urine for the first ten minutes, but after the lapse of twenty hours there was evidence of larger formaldehyde formation in the acidified urine. It is open to discussion whether the oral administration of sodium acid phosphate produces so marked an effect on the urine as in the laboratory experiment.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 78; [2]*Ibid.* 1192; [3]*Wien. klin. Woch.* 1912, 163; [4]*Ibid.* 151; [5]*Lancet*, 1912, i, 1335.

HORMONAL.

When first introduced into medical practice, hormonal was considered a drug which might safely be administered either by intramuscular or intravenous injection. Recently, however, several observers record serious collapse with or without rigors immediately following intravenous application of the drug. Dittler and Mohr[1] saw, half an hour after the intravenous injection of 14 c.c., a sudden severe collapse with a marked rigor and fall of blood-pressure. Kretschmer[2] and Hesse[3] both saw the severest collapse develop before the injection was completed. Wolf[1] had a similar experience, the patient, during the injection, becoming collapsed with cyanotic lips, dilated pupils, and loss of the radial pulse. All these cases recovered under the use of cardiac stimulants. Jurasz[5] was not so fortunate, as his patient rallied only for a short time and succumbed two and a half hours after the intravenous injection of 20 c.c.

The explanation of these unpleasant experiences seems to have been found by Popielski[6] and Dittler and Mohr, who observed a severe and sudden lowering of blood-pressure following the intravenous injection of hormonal which is said to be due to the presence in it of vasodilatin. It must therefore in future be recognized that hormonal is a dangerous drug to give intravenously in cases where the heart is weakened. This rather restricts its use, especially in such surgical conditions as intestinal paresis following peritonitis or abdominal operations.

That hormonal has a marked action upon peristalsis is shown by the case of Kausch's[7] patient, a boy aged thirteen, suffering from slight **Peritonitis** following perforation of the appendix. There was

intestinal paresis, with distension of the abdomen and constant vomiting of the contents of the upper intestine. As ordinary remedies failed to give relief, 20 c.c. of hormonal were given intravenously. This induced a severe rigor lasting fifteen minutes, but in two hours the bowels began to act and flatus to pass regularly, though the intestinal vomiting persisted for about ten hours. Twenty-three hours after the injection a severe diarrhœa set in which, despite opium and tannigen, lasted for six days. Bovermann[8] also reports a case which shows that the peristaltic action may be quite well seen even though the drug produces temporarily a severe collapse. During the injection the patient complained of pain in the head and of feeling unwell. An hour and a half after the injection there was a sudden severe rigor, with collapse, pallor, and loss of the radial pulse. The symptoms were very serious for about ten minutes and then gradually passed off. Despite these unpleasant features, the effect upon the intestinal paresis was well marked, as within a few hours the patient passed fluid stools.

Zuelzer,[9] after using hormonal for over two years without experiencing any trouble, suddenly had a run of four cases where the intravenous injections were all followed by severe headache, rapid flying pulse, etc. He concludes that something must have gone wrong in the preparation of the drug, and apparently this was the case, as albumose was detected. In future, Zuelzer has agreed to test the hormonal for the manufacturers before it is put upon the open market. Dittler and Mohr[10] find that in animals the intravenous injection of hormonal was immediately followed by a great fall in blood pressure, even though the dose was too small to induce peristalsis.

References.—[1]*Münch. med. Woch.* 1911, 2427; [2]*Ibid.* 1912, 474; [3]*Deut. med. Woch.* 1912, 643; [4]*Münch. med. Woch.* 1912, 1107; [5]*Deut. med. Woch.* 1912, 1037; [6]*Münch. med. Woch.* 1912, 534; [7]*Berl. klin. Woch.* 1912, 881; [8]*Münch. med. Woch.* 1912, 1553; [9]*Deut. med. Woch.* 1912, 1233; [10]*Münch. med. Woch.* 1911, 2427.

IODINE.

Alcock[1] finds that the application of a 2 per cent iodine solution in 90 per cent industrial methylated spirit makes surgical dressings unnecessary after operations. The application kills the superficial microbes, and by its hardening and contracting effect upon the orifices of the sweat-glands prevents the deeper-situated germs from infecting the skin. The skin is dry-shaved and painted with the iodine solution early in the morning, and again at the operation. No wet swabs are used, all bleeding is carefully checked, and the wound rendered quite dry. In closing the wound, great care is paid to the correct apposition of the wound edges. After it is closed iodine is applied, but no other dressing, as this tends to macerate the tissues. As a rule the iodine is used again three hours after the operation, to sterilize any exudation, and then a daily application for the next three days is sufficient. In the vulvar and perineal region, the iodine is applied after each micturi-

tion. Only such wounds as require no drainage and can be completely closed, are suitable for this method. It is necessary to ensure that the patient does not scratch the wound while coming out of the anæsthetic. Leedham-Green[2] prefers alcoholic solutions of perchloride of mercury containing 1–1000 of 70 per cent spirit. This penetrates as well as iodine spirit, and is not so readily neutralized, though the hardening effect on the skin is less marked.

Hoffmann and Budde[3] find on investigation that immersion in 5 per cent alcoholic tincture of iodine for five days completely sterilizes catgut. Unless, however, the catgut is firmly rolled up on spools it suffers a distinct loss in tensile strength, the breaking-point being reduced to about one-half. Whenever iodine is allowed to act upon catgut, free hydriodic acid is stored up in the catgut. This acid is very easily absorbed by albuminous substances. It is therefore advisable to use only freshly-prepared tincture of iodine for sterilizing catgut, since a tincture which has already been so used contains large quantities of albumin and hydriodic acid. As catgut impregnated with iodine is not very readily absorbed, it is advisable to prepare it by a rapid process which diminishes the iodine content. This can be done by sterilizing the catgut by dry heat and then immersing it for half an hour, without stretching, in 10 per cent tincture of iodine containing 3·5 per cent potassium iodide, which delays the formation of free hydriodic acid.

Uftugeaninoff[4] states that the internal administration of 3 to 4 mins. of tincture of iodine thrice daily is of use in **Typhus Fever.** Used early, it prevents the rash becoming severe, and in the later stages hastens the disappearance of petechiæ. The temperature falls by lysis, nervous excitement is less severe, and the disease is shortened.

Gill,[5] after extensive trial, warmly recommends local application of tincture of iodine in **Oropharyngeal Infections of Children.** The excellent therapeutic results amply justify the pain and smarting of the application. Older children can use the pure tincture; but for young children and infants it is best to dilute it with one volume of alcohol.

Reyn[6] uses nascent iodine in the treatment of **Lupus.** The iodine is liberated by the electrolytic action of a current of 2 to 3 milliampères and 65 volts, the iodine appearing at the positive pole. He uses a series of 10 to 20 thin platinum-iridium needles fixed in batches of five to metal plates. Five such needles can be inserted at once without causing much pain. An hour before the treatment the patient swallows 30 to 45 gr. of sodium iodide on an empty stomach. The current is allowed to act for two minutes. In a few cases of intractable lupus this electrolytic iodine treatment has given excellent results. It is not painful, and does not cause a severe local reaction. He suggests it may also prove of value in the local treatment of tumours.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 233; [2]*Ibid.* 1911, ii, 1078; [3]*Deut. med. Woch.* 1912, 599; [4]*Berl. klin. Woch.* 1911, 1877; [5]*N.Y. Med. Jour.* 1911, ii, 1179; [6]*Berl. klin. Woch.* 1911, 1873.

IODOSTARIN.

Bachem[1] describes this new inorganic iodine compound which may prove of therapeutic value. Iodostarin is the di-iodide of taririnic acid, $CH_3(CH_2)_{10}CI = CI(CH_2)_4COOH$. Insoluble in water, it has neither odour nor taste. Though it is not affected by artificial digestion, it seems to be rapidly split up in the body (probably in the intestine), as iodine appears in the saliva and urine within 30 to 40 minutes of administration. The excretion is prolonged and regular, about 70 to 80 per cent of the available iodine being excreted in the urine in the course of three days. The brain and liver give a marked iodine reaction for 16 to 20 hours, whereas after potassium iodide these organs are practically free of iodine within three hours. Iodostarin contains 47·5 per cent of iodine. It is thus the richest, but at the same time the cheapest, organic iodine compound on the market. The toxicity is very low, and in animal experiments it exerts only a very slight action upon the circulation and respiration.

Reference.—[1]*Münch. med. Woch.* 1911, 2161.

JOHA.

Schmidt[1] speaks highly of this suspension of salvarsan in iodipin and anhydrous lanolin. He finds that it keeps for several months (up to six at least) without undergoing change. It does not cause pain, local infiltration, or necrosis when injected intramuscularly, and is consequently suitable for the treatment of very young patients or those who are highly excitable. The therapeutic action is slower than that exerted by intravenous injections of salvarsan, but is free from the unpleasant reaction so often seen after the latter. Schmidt believes that in addition to joha injections, grey oil should also be used.

Reference.—[1]*Münch. med. Woch.* 1912, 694.

LACTOSE.

A weak solution of lactose when injected into a vein acts as a *diuretic,* the foreign sugar being removed from the blood by the kidneys. Its diuretic action when administered by the mouth is more doubtful, and the results obtained by different observers do not agree. Theoretically it is unlikely that lactose given by the mouth will increase the secretion of urine so long as the liver is able to deal with the sugar brought to it by the blood. If from any reason some of the sugar reaches the blood unchanged, its removal will probably be attended with an increase in the urinary fluid. Now this is exactly what has been discovered clinically by Cramer.[1] In many cases the ingestion of 100 grams lactose produced no diuresis, while in those patients in whom diuresis resulted it was found that glycosuria was also established, so that in these the liver was probably unable to deal with all the sugar brought to it.

Reference.—[1]*Rev. de Méd.* 1912, 295.

LAVAGE, TRANSDUODENAL.

Jutte[1] describes his technique. A 4-ft. long graduated thin rubber tube with a loaded end is introduced into the stomach, with the patient lying on the right side. By drinking 100 c.c. of water, enough peristaltic contraction is set up to carry the loaded end into the duodenum. By exhausting with a syringe or syphon, the contents are withdrawn. An alkaline content indicates the presence of the end of the tube in the duodenum. It is then easy to wash out the duodenum and small bowel, either with soap and water or a solution of common salt. He records cases of inveterate **Asthma** and **Intestinal Flatulence** in which this procedure was beneficial.

REFERENCE.—[1]*N. Y. Med. Jour.* 1912, i, 543.

LECITHIN.

From experiments on animals, Bain[1] finds that small doses of lecithin stimulate the formation of blood, markedly increasing the number of red and white corpuscles and the percentage of hæmoglobin. The leucocytic increase is chiefly mononuclear. He considers that it stimulates metabolism, and that any beneficial effect upon the nervous system depends on this.

REFERENCE.—[1]*Lancet*, 1912, i, 918.

LIPOIODIN.

This compound, introduced by Loeb and von den Velden,[1] is stated to be the ethyl ester of di-iod-braxidinic acid. It is claimed that it is neuro- and lipotropic in action; but this is rather disproved by the experiment of Bachem,[2] who found that no iodine was present in the brain sixteen hours after a rabbit received 1·2 gr., though it could still be shown in the blood, liver, and kidneys. Löns[3] studied the excretion of the iodine in the milk, and found that though it appears in urine within 2 hours, it is not present in the milk till 4 to 8 hours, and then disappears in 52 hours, though it is present in the urine for 72. In the milk, the iodine is not bound up with the fat, but seems to be free in the fluid of the milk. With potassium iodide, the iodine excretion appears sooner, but lasts a shorter time.

REFERENCES.—[1]*Ther. Monats.* 1911, iv.; [2]*Münch. med. Woch.* 1911, 2161 [3]*Berl. klin. Woch.* 1911, 2064.

LUMINAL.

This new drug, phenylethylbarbituric acid, has been introduced as a sedative and hypnotic. Its pharmacology is described by Impens.[1] It is not very active for cold-blooded animals, but in frogs causes sleep, with slowing or abolition of the respiration and slowing of the pulse. The reflexes are diminished. The isolated frog heart shows that the rate and size of the pulse, and thereby the work of the heart, are diminished. Cats react to the smallest doses of the drug. Doses of 0·03 gram per kilo, given either subcutaneously or by the mouth, are active, causing sleep in from one-half to one hour, lasting the whole

day and often inducing sleepiness on the following day. With this small dose, sleep is not very deep. Larger doses do not hasten the onset of sleep, but it is more lasting and profound, while except with very large doses, no narcosis is induced. In dogs also the same action is seen, and there is seldom any preliminary excitement. The blood-pressure is slightly reduced with small doses. Occasionally a transient rise precedes the fall in blood-pressure. The drug slows the respiration even before sleep is induced, and this persists after sleep has passed off. Toxic doses paralyze respiration, while the heart is still active. The oxidation processes in the body are diminished. The drug is excreted unchanged by the urine, and even after long-continued administration the kidneys are not affected. Impens states that with luminal the tendency to spasmodic twitching seen in the sleep of many animals under veronal is absent.

The drug has been tested clinically by several observers. The general verdict is satisfactory. It can be given by the mouth, subcutaneously, or as an enema or suppository. Loewe[2] states that it acts as a sedative and hypnotic in all forms of **Excitement** of mental cases, and in the **Sleeplessness** of degenerates and neurasthenics. It has a favourable action in some forms of bodily pain. Sleep of normal length is induced by doses of 0·2 to 0·4 gram in non-excited patients, and in excited mental cases 0·6 to 0·8 gram, at any rate at first, are certain in action. Side actions are seen only after prolonged use, and correspond to those seen after veronal, e.g., confusion, slight intoxication, lowering of blood-pressure. Occasionally skin rashes appear. Contrasted with veronal, 0·2 to 0·3 gram are as active as 0·5 gram veronal. In combination with small doses of morphia, luminal can be used instead of hyoscine except when an immediate action is desired.

Schaefer,[3] while agreeing with these observers, states that the new drug is sometimes irregular in its action. According to him, 0·3 to 0·4 gram gives the same effect as 0·5 veronal as a simple hypnotic, but some patients do not react at all, and others are so much affected that a toxic action is suggested. If larger doses (0·5 to 0·6 gram) are used, the deep sleep is practically constant. One of his patients slept soundly for three days and then less soundly for another two, before throwing off the action of the drug. He indicates the harm this might do to a pneumonic patient or to anyone suffering from bronchitis. He ascribes to the drug the death of a man with well-marked arteriosclerosis and chronic bronchitis who, after a dose of 0·4 gram by the mouth had given sound and quiet sleep, received next evening a hypodermic injection of 0·5 gram, which caused very deep sleep, from which he woke for a short time, but after five days died of hypostatic pneumonia. He thinks the sedative action of the drug is the most important effect. It is more potent than that of either chloral or trional. It acts well in sleeplessness or excitement induced by bodily pain. It has no deleterious action on the kidneys, heart, or gastro-intestinal tract.

Graeffner[1] states that luminal is no anodyne, and is not indicated when there is coughing, asthma, frequent desire to micturate, sweating, or in the lancinating pain of tabes. So far he has not noticed any cumulative action. One of his patients has taken at short intervals eighteen doses of 0·4 gram without ill effect, but the fact that the hypnotic action is often seen only after the second dose, indicates the possibility of cumulation. As a precaution he advises an interval of two days after every four days' use, and the administration of 1 to 2 grams sodium carbonate thrice daily in large quantities of water. Luminal acts well in alleviating the tremor of **Paralysis Agitans.** Juliusberger[5] also is satisfied with the new drug, which he thinks will reduce the use of hyoscine.

Sioli[6] finds luminal a very satisfactory hypnotic in **Arteriosclerosis** and **Advanced Age.** In small doses the action begins to show itself in fifteen minutes and gradually increases, so that sleep comes on in about an hour. It acts as a good sedative in cases of comparatively slight **Excitement** only. If the excitement is marked, its action as a sedative is uncertain when given alone, but if combined with a subcutaneous injection of hyoscine it proves very potent. For such excited patients it is advisable to administer 1 mgram hyoscine with not less than 0·4 gram or more than 0·6 gram luminal. As a rule, with this dosage the excitement soon diminishes, and within two hours the patients go to sleep for eight to ten hours; the following day the sedative action is seen in unwonted quiet. The drug does not seem to lose its action even if frequently administered.

REFERENCES.—[1]*Deut. med. Woch.* 1912, 945; [2]*Ibid.* 947; [3]*Berl. klin. Woch.* 1912, 1038; [4]*Ibid.* 939; [5]*Ibid.* 940; [6]*Münch. med. Woch.* 1912, 1374.

MELUBRIN.

This trade name has been given to sodium phenyldimethylpyrazolon amidomethanesulphonate, which has been recommended by Loening[1] as a useful and reliable anti-rheumatic. As is evident from its chemical composition, melubrin is a derivative of antipyrin. Krabbel[2] also found the new drug satisfactory in acute **Rheumatic Affections.** It does not seem to depress the circulation. Müller[3] states that for children under fourteen years of age, 1 gram thrice daily is required; for adults suffering from acute rheumatic fever, 2 grams may be given three or four times daily. Even these large doses cause no gastric disturbance and there is no ringing in the ears. The drug acts fairly rapidly, pain and swelling ceasing in two to three days; but to prevent relapses it is necessary to keep the patients in bed for a further week and continue the drug in smaller doses up to 1 gram three times daily. In two cases the drug produced a medicinal rash. It acts well in **Erythema Nodosum.** As a general antipyretic the drug is also satisfactory. The temperature falls in about an hour, and remains low for six to eight hours. The drug does not induce much sweating.

REFERENCES.—[1]*Münch. med. Woch.* 1912, Nos. 9, 10, 11; [2]*Med. Klin.* 1912, No. 16; [3]*Wien. klin. Woch.* 1912, 960.

MENTHOL.

Leroux[1] draws attention to the fact that the intranasal introduction of menthol is often followed by alarming toxic symptoms. In many infants and young children such insufflations have produced a condition of immediate danger, with great increase in secretion, spasm of the glottis, cyanosis, and convulsions. He considers that menthol should not be used as a local application in the nasal catarrh of children under three years of age.

REFERENCE.—[1]*Presse Méd.* 1912, 114.

MERCURIC PERCHLORIDE.

In 1910, Ottolenghi published some interesting experiments which showed that even very prolonged immersion in strong solutions of perchloride of mercury did not kill off anthrax spores or even ordinary staphylococci. A reinvestigation of these statements by Croner and Naumann[1] has completely confirmed Ottolenghi's findings. They find also that perchloride solutions act only as inhibitors of germs, but do not readily kill them; so that after neutralization of the germicide, the germs may become actively virulent again. The ordinary corrosive tablet used to form 1–1000 solutions often contains common salt, and therefore the question whether NaCl affected the antiseptic power was investigated. Small quantities of salt do not diminish it greatly, but the addition of NaCl always diminishes the germicidal power of the perchloride solution. The authors think that perchloride does not act by precipitating albumin, but that it is taken up by the germs by a process of absorption, and that the presence of even small quantities in the micro-organisms prevents their growth, but does not kill them.

REFERENCE.—[1]*Deut. med. Woch.*, 1912, 1784.

MERCURIC SUCCINIMIDE.

Wright[1] believes that deep intramuscular injections of succinimide of mercury are curative in diseases caused by vegetable parasites. He claims to have cured in this way one case of acute miliary **Tuberculosis,** two cases of **Pulmonary Tuberculosis, Typhoid Fever, Bronchopneumonia, Epidemic Catarrh, Follicular Tonsillitis, Furunculosis,** etc. With the exception of the tuberculous cases, the diseases were practically aborted by one or two injections. With increasing experience he has gradually increased the amount injected, and in his last series[2] of cases of **Pneumonia** and **Gonorrhœal Arthritis** he used over $1\frac{2}{5}$ gr. in one case, giving $\frac{4}{5}$ gr. as a single dose. In gonorrhœal rheumatism the disease was cut short in three instances by a single injection of 1 $\frac{2}{5}$ gr., while another three each received two injections of $1\frac{2}{5}$ gr. and $\frac{4}{5}$ gr.

REFERENCES.—[1]*Med. Rec.* 1911, ii, 1109; [2]*Ibid.* 1912, i, 1027.

NARCOPHIN.

Straub[1] points out that there is a difference between the action of opium and morphia. The recognition of this fact has led to the introduction of pantopon, but though this may have been an advance,

the curious fact resulted that this mixture of some twenty different alkaloids, many of them inert, acted more powerfully than morphine. He explains this effect by synergic action. The chief one of these inert alkaloids which intensifies the action of morphine is narcotine, which itself is almost inert. He has studied the synergic effect on mice of associating morphine and narcotine, and thinks that when narcotine is associated with morphine, the distribution is altered so that the respiratory centre is less implicated and the cerebrum is more influenced. To obtain this more favourable selective action he has combined the two alkaloids with the dibasic meconic acid as a double salt morphine-narcotine meconate, $C_7H_4O_7.C_{17}H_{18}NO_3.C_{22}H_{23}NO_7$, which he calls narcophin.

Zehbe[2] has tested the drug *clinically*, administering it either hypodermically or by the mouth. In both cases a 3 per cent solution was used, the subcutaneous dose being 1 c.c. (= 0·03 gram), while by the mouth 15 to 20 to 30 mins. were given. When given to check cough, he found that the action was produced more rapidly than with morphine alone, but lasted a shorter time. In alleviating pain it seemed to act satisfactorily, and was also effective in producing sleep. It has no unpleasant after-action except for unmistakable depression of intestinal peristalsis. Compared with other opium preparations, he states that it most closely resembles pantopon in action, but seems less likely to produce after-effects. As a respiratory sedative it is less active than codeine, but as it is better borne it can be given in larger doses. In general its action is weaker than morphine, but it has the advantage of freedom from after-effects.

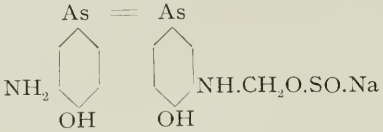
Schlimpert[3] has tested narcophin in *gynæcological* practice. It satisfactorily relieves pain, and according to him has no action on the intestinal peristalsis. The chief difference from the action of morphine alone is that the dreams are less marked and the after-depression is not seen, consequently it is less likely to lead to the development of a habit. He also used the new drug in combination with hyoscine as a preliminary to the production of sacral, spinal, or inhalation **Anæsthesia.** The results were very satisfactory. Out of 263 cases there was no trouble with the respirations. The action is rather slower in its onset than morphine, but it lasts longer and seems to be deeper as regards analgesia, while if anything the sensorium is less depressed. The analgesic action lasts much longer.

References.—[1]*Münch. med. Woch.* 1912, 1542 ; [2]*Ibid.* 1543 ; [3]*Ibid.* 1544.

NEOSALVARSAN. (*See also* Salvarsan, Syphilis.)

By a condensation of acid sodium formaldehyde sulphoxylate with salvarsan, Ehrlich has prepared a soluble compound, neosalvarsan, which seems to possess the therapeutic activity of salvarsan, while certain advantages are gained, such as solubility in water, with the formation of a neutral solution. In preparing this soluble salt, Ehrlich has taken advantage of the fact that by condensation of acid sodium formaldehyde sulphoxylate with benzene compounds, soluble products

are in many cases obtained. The general reaction is $R.NH_2 + HO.CH_2O.SO.Na = RNHCH_2O.SO.Na + H_2O$. In the case of salvarsan there are two available NH_2 groups, so that two compounds could be formed. Neosalvarsan is the monoproduct, only one of the amido groups being utilized. The graphic formula is :—



It occurs as a yellowish powder, rather coarser than salvarsan. It dissolves readily in cold water, forming a neutral solution. The preparation oxidizes readily, forming toxic products. Oxidation takes place more rapidly if the solution is heated ; therefore in the preparation of solutions of neosalvarsan for injection, distilled water is used at not much more than room temperature, i.e., not over 30° C. To prevent any " water-error " risk, the water should be freshly distilled, sterilized, and then allowed to cool. It is essential that the solution of the drug should be prepared immediately before use. Owing to the presence of the sulphoxylate group, the new preparation contains less salvarsan than the old form, consequently the dose is rather larger. About ·9 gram of neosalvarsan is equivalent to ·6 gram salvarsan. If 20 c.c. of water are used for each 0·15 gram of the drug, a slightly hypotonic solution is formed, which can be injected intravenously. It is inadvisable to dissolve the drug in saline solution, as it is apt to become turbid or form precipitates. The advantages of neosalvarsan are : (1) Ready solubility ; (2) Neutral reaction ; (3) Avoidance of the use of saline solution and neutralization ; and (4) A smaller volume to be injected.

In experiments on the lower animals, there does not seem much difference in the toxicity of salvarsan and neosalvarsan, if equivalent quantities are employed. Rats are more susceptible to neosalvarsan than to salvarsan, but in the guinea-pig this is reversed.

The experiments of McIntosh, Fildes, and Parker[1] show that neosalvarsan in watery solution acts much more powerfully on trypanosomes than alkaline solutions of salvarsan.

At first it was thought that neosalvarsan had very little toxic action in man, and Schreiber, one of the first to test the drug clinically, advised very large doses at intervals of a day. As an average course of treatment he gives about 5 grams in one week, in four doses = 3·3 grams of salvarsan. With strong adult men he gives even larger amounts—four doses of 1·5 gram neosalvarsan intravenously in a week = 4 grams of salvarsan. It appears, however, that these doses are rather large, and most authorities now prefer to use smaller quantities. It was soon found that although the new preparation had less tendency than salvarsan to produce headache, gastro-intestinal irritation, and rigors (though slight shivering is not uncommon—

Gutmann[2]), its use was more frequently followed by medicinal rashes, which in some cases were accompanied by severe toxic symptoms.

The new drug also has not prevented the occurrence of fever after the first injection. The temperature rises somewhat slowly; the febrile reaction is at its height about six hours after the injection, and has almost invariably passed off by the next day. It is therefore suggested that this febrile reaction is due to the liberation of endotoxins from killed spirochætes. In 34 out of 131 injections, Gutmann noted fever 21 times after the first injection, 6 after the second, and 7 after the third. Usually fever was noted only with the first and not with the succeeding injections. In some cases the opposite was seen, and the first injection was not followed by fever, whereas the second or third, or in some cases the second and third, were; in such it was usually much higher than after a first injection. In 28 cases where three injections were given at very brief intervals, he noted a febrile reaction in 15 after the first, and in 11 after the second and third injections. Bernheim's[3] experience was even worse. Using four doses at intervals of a day, he had in 10 cases fever after the first, and in 13 after the second to the fourth injection. Both Gutmann and Bernheim think that in such cases the febrile reaction is due to the introduction of too much arsenic. Owing to the short interval between the doses, the excretion cannot cope with the rapid introduction.

All observers agree that neosalvarsan is more likely to produce a toxic rash than salvarsan. Stühmer[4] thought that as a rule the symptoms were not severe and the rash was of little moment, but both Gutmann and Bernheim saw cases where the toxic arsenical action was very severe. All the patients recovered. In one of Bernheim's cases, four intravenous injections of 0·6 gram each were given to a man suffering from secondary syphilis. The first three injections—on the 13th, 15th, and 17th of April—caused no fever, but a little headache and abdominal pain. The fourth injection, on the 19th of April, caused a high fever (104°F.), pain in the head and abdomen, diarrhœa, and nausea. Next day the temperature remained above normal, and the nasopharyngeal mucous membrane and the conjunctivæ were swollen. There were pain in the throat, loss of appetite, and great prostration. On April 21st the temperature was still raised, and a rash appeared over the whole body. On April 22nd the fever continued, and there was bleeding from the inflamed nasal mucous membrane. The spleen was enlarged, the pulse fast and weak, but regular. The fever did not disappear till the evening of the 24th, when the rash gradually faded with the disappearance of all the alarming symptoms. Bernheim therefore concluded that Schreiber's plan of using large intravenous injections at intervals of forty-eight hours is dangerous, and suggested that at least seven to ten days should elapse between the injections, so that the excretion of arsenic may be permitted.

Iversen[5] has followed Schreiber's plan, with good results as a rule, in forty cases of syphilis. In one woman, however, who at intervals of one day was given 0·75, 0·75, 0·6, 0·6 gram intravenously, there

were general weakness, greyish-yellow colour of the face, urticaria, and pains in the bones. In women and weakly men he recommends an interval of two to three days between the injections. He, however, lays stress on repeating the injections, at as short intervals as possible. The investigation of recurrent fever has shown that salvarsan acts much more rapidly and effectually during the first attack, and distinctly slower in relapses. Apparently the spirilla after the first attack produce progeny which is more resistant to the antibodies in the blood and to medicinal remedies. He believes that the same thing occurs in syphilis, and that treatment is most effectual in the very early stages.

A case reported by Gutmann shows, nevertheless, that even an interval of seven to eleven days between the first and second, and second and third injections, is not sufficient to prevent toxic accumulation. Gutmann's patient received mercurial treatment (asurol injections) before and between the neosalvarsan doses. The first neosalvarsan injection of 0·45 gram caused no disturbance, but seven days later the second injection produced fever and a rigor on the day of injection. Next day the patient had no fever, but felt weak. The third injection, eleven days later, produced transient fever which had disappeared by the following day, but for the first three days he felt "seedy," and had slight shivering occasionally. On the fifth day (May 19th) he had a rigor, and the temperature rose to 39·6° C.; on May 20th there was continuous fever (39° C.), the liver and spleen were enlarged and palpable, and albuminuria and slight indicanuria were present without casts; on May 21st herpes appeared on the face, with difficulty of swallowing, and redness and swelling of both tonsils and the oral mucous membrane; temperature, 38·7° to 39·8° C. On May 23rd there were dirty green exudation on left tonsil, fever, and severe prostration, with albuminuria and urobilinuria; on the 24th, in the morning, a rash was noted on the abdomen spreading to the breast, with stomatitis, great swelling of left tonsil, and marked prostration. On the 25th and 26th, the stomatitis rapidly increased, with necrosis of mucous membrane of the left cheek, and high fever; on the 27th, there was necrosis of the uvula, right tonsil and cheek, with fever, the rash fading slowly; on the 30th, the rash was gone and the mouth was slightly better, the fever also diminishing. On June 2nd, the mouth was healing rapidly and the general condition was satisfactory.

Intramuscular Injections.—Ehrlich holds that the intramuscular application of salvarsan gives a more powerful therapeutic action than intravenous administration. Owing to the difficulty of overcoming the pain and the local toxic action, salvarsan cannot easily be given intramuscularly. Neosalvarsan forms with water a neutral solution, which, though it causes pain, can be administered intramuscularly. It has less tendency to produce local tissue necrosis than salvarsan and is more rapidly absorbed (Stühmer[6]), but Schreiber and others who have used both intravenous and intramuscular injections, have practically abandoned the latter for the former. Rytin[7] states that intramuscular injections are invariably followed by pain which ordin-

arily lasts several hours. The more dilute the solution, the greater the pain. At the end of twenty-four hours an induration appears at the site of injection, or painless œdema which lasts a few days. There is no redness, inflammation, nor heat. Wolbarst,[8] after many experiments, finds that by suspending the drug in glycerin and then dissolving this suspension in a few drops of 1 per cent β-eucaine solution, the intramuscular injection is painless except for a slight stiffness lasting for a few hours. He suspends 0·9 gram neosalvarsan in 4 c.c. glycerin, in a mortar, and then adds a few drops of 1 per cent β-eucaine solution in distilled water till an almost clear watery solution is obtained. This is divided into four portions and injected in four places.

Intralumbar Injection.—Wechselmann[9] has injected neosalvarsan in dilute solution into the spinal canal, and finds that it does not produce any reaction. He uses a solution of 0·15 gram in 100 c.c. water, and injects 4 to 7 c.c. for adults, and 1 to 2 c.c. for infants.

References.—[1]*Lancet*, 1912, ii, 82; [2]*Berl. klin. Woch.* 1912, 1467; [3]*Deut. med. Woch.* 1912, 1040; [4]*Ibid.* 983; [5]*Münch. med. Woch.* 1912, 1436; [6]*Deut. med. Woch.* 1912, 983; [7]*N.Y. Med. Jour.* 1912, i, 1357; [8]*Med. Rec.* 1912, ii, 145; [9]*Deut. med. Woch.* 1912, 1446.

OPIUM.

Popper and Frankl[1] have investigated the action of the more important alkaloids of opium on the intestinal muscular tissue. They find that there is a difference in action between the phenanthrene group (morphine, thebaine, codeine) and the isochinoline group (papaverine, narcotine, narceine). The phenanthrene group increase the muscular tonus and pendulum movements, acting both on the circular and longitudinal fibres, whereas the isochinoline group diminish muscular movements and reduce the tonus. Schmidt[2] has investigated the action on the intestine of the residue, consisting chiefly of resins, india-rubber, and gums, obtained after extracting opium with water. This causes slight constipation.

References.—[1]*Deut. med. Woch.* 1912, 1318; [2]*Münch. med. Woch.* 1912, 1546.

OPON.

As the result of experiments upon animals, it is usually assumed that apart from morphine and codeine, the main action of the opium alkaloids is convulsant; but some experiments by Winternitz[1] with opon, a morphine-free pantopon, show that in large doses it produces a sedative and not a convulsive action. The preparation is not very active, and doses of 7½ to 15 gr. are required to produce the hypnotic action. Owing to this and to the further fact that the taste is extremely bitter, it is not likely that the preparation will have much demand. Winternitz' experiments show that opon does not act as a hypnotic in the presence of pain, but in simple **Insomnia** it induces dreamless sleep within a quarter to three-quarters of an hour, and which lasts for several hours. Apparently the major portion of opon consists of narcotine, but codeine is also present.

Reference.—[1]*Münch. med. Woch.* 1912, 853.

OPOTHERAPY.

Starkey[1] believes that the combined use of pituitary, ovarian, and testicular extracts counteracts the undesirable effects sometimes produced by thyroid preparations. He used the pituitaries and ovaries of sheep, and testicles from young cocks. The glands are removed aseptically, freed from connective tissue, and treated as follows: Pituitary gland one part, thyroid (including parathyroid) 2 parts, ovary and testis of each ten parts, are mixed and reduced to a fine paste, and allowed to macerate in an equal bulk of pure glycerin for forty-eight hours. The filtered product is injected intramuscularly in doses of about 15 min.

From an experience of 480 cases he comes to the following conclusions. In acute diseases, **Pneumonia, Typhoid Fever, Influenza, Scarlet Fever, Tuberculosis,** the injections increase oxidation and stimulate the defensive functions, thereby facilitating the destruction of the pathogenic organisms in each disease. He is careful to state that the polyglandular extract is not a "cure all," but acts by placing the body in a better position to assist, through stronger vitality and defensive activity, whatever treatment was used. It acts as a cardiac and muscular stimulant, and has a beneficial effect on the nervous and mental condition in certain acute diseases. In chronic diseases it acts well in three classes of cases: (1) Where adynamia is the essential feature, e.g., **Neurasthenia** and **Depressive Melancholia,** atoxic and spastic **Constipation, Impotence, Sexual Neuroses** of the unmarried, and the functional and progressive **Debility** of old age; (2) Where, in addition to adynamia, there existed a toxæmia of some kind as underlying cause, e.g., **Epilepsy, Rheumatism, Chorea, Rheumatoid Arthritis, Paralysis Agitans;** (3) **Amenorrhœa** and **Dysmenorrhœa** of anæmia and debility, **Menorrhagia** and **Metrorrhagia** due partly to the same general condition, and partly to uterine disorders, and **Hysteria.** The polyglandular extract is almost a specific for neurasthenia. It stimulates markedly mental, nervous, and muscular activity, as well as general metabolism and oxidation. It augments powerfully the contractile power of the cardiovascular system, and is contraindicated in hypertension. It increases the action of other drugs, such as arsenic, salicylates, mercury, iodides.

Ott and Scott[2] have studied the **Galactagogue** effect of intravenous injections of extracts of animal organs in goats. Infundibulin had the greatest action, starting the flow of milk in about one minute, the maximum being reached in four minutes, after which it rapidly falls to normal. In one experiment, the intravenous injection of 5 drops increased the normal amount eighty times in the first five minutes, and a repetition of the injection increased it fifteen times. The next most active substance was thymus gland, which increased the secretion to sixteen times the normal; while corpus luteum and pineal body increased the secretion fourfold in five minutes.

REFERENCES.—[1]*N.Y. Med. Jour.* 1912, ii, 7; [2]*Ther. Gaz.* 1911, 689.

OXYGEN.

Derose[1] states that oxygen may be injected subcutaneously into the connective tissue to relieve **Cyanosis,** in cases where it is impossible to administer the gas by inhalation. By a simple arrangement of two wash-bottles, the oxygen is displaced from the lower bottle by water, and driven into the subcutaneous tissue. If the capacity of the bottle be known, it is easy to regulate the dose, which usually runs from ½ to 1 litre.

Reference.—[1]*Med. Press and Circ.* 1912, i, 459.

PITUITRIN.

By general consent this drug is found of value in obstetric practice. It does not seem of much use to attempt to bring on labour by administering it. Even when pregnancy is almost completed, it is found that large and repeated doses are required to induce regular uterine contractions. When labour has *commenced,* pituitrin injections act well. After an injection of the amount usually given (1 c.c. of pituitrin), within three to ten minutes the uterus begins to contract powerfully. At first the contractions may be abnormally severe and prolonged, but in the course of a few minutes they become regular though remaining powerful. The action of the drug begins to disappear after about an hour, but can usually be re-established by a second injection. The verdict of all observers is unanimous that pituitrin very seldom produces any deleterious action upon either the mother or child. In a few cases the child is born asphyxiated. In one case melæna came on three days after birth.

In the *first stage* of parturition the drug acts quickly, but the best action at this stage is seen when the cervix has already commenced to dilate; the nearer the rupture of the membrane, the greater the effect of pituitrin. It is, however, chiefly in the *second stage* of expulsion that the action is best seen (Jaeger,[1] Vogt,[2] Studeny[3]). The pains are more frequent and powerful, and the interval between them is shortened. In this second stage the drug is especially useful in weakness of the uterine contraction resulting from a flattened pelvis. Vogt[2] states that it is best to wait in such cases till the head has begun to be moulded. If at this stage pituitrin is given, the birth may often be completed without instruments. Vogt states that since using it he has never once had to use forceps in 600 cases, though about 40 to 50 per cent showed some degree of contraction of the pelvis. He holds that the position of the child is immaterial. Hamm also finds that since he has used pituitrin the number of forceps cases has diminished almost to vanishing point.

The general verdict is that pituitrin is the sovereign remedy for **Secondary Weakness of the Uterine Contractions,** and that its action is most marked the later it is given and the more the lower segment of the uterus is dilated. Given when the cervix is fully dilated, the action is very striking. Within three to four minutes a powerful contraction of the uterus is induced, and frequently the child is born

within a few minutes. The first pain is apt to be very prolonged, and may last for several minutes (seventeen minutes was noted in one case by Hamm). In a short time, however, the pains become regular but more frequent and powerful. When the drug is administered at an earlier stage of labour, before the parts are thoroughly dilated, there does not seem the same tendency to produce spasm of the uterus.

Several observers record their experiences with the drug in cases of **Cæsarian Section,** but here the action seems definitely inferior to that of ergot in inducing permanent contraction and preventing atonic bleeding. In cases of **Placenta Prævia** the drug often acts well. Studeny used it in nine cases, with brilliant results in six. In two the contractions were not strong and did not last long, and the last case was a total failure, the drug producing no action. Vogt used it successfully in seven cases of placenta prævia lateralis, in combination with puncture of the membranes. Nephritis due to pregnancy does not contraindicate the use of the drug (Studeny, Jaeger, Fries).

Pituitrin does not apparently produce uterine contractions except when parturition has commenced. Schiffmann[4] found that it was not possible to bring on **Abortion** by administration of pituitrin alone, in three cases where for various reasons it was considered inadvisable to permit pregnancy to proceed to the full period. Practically no uterine contractions were obtained. If, however, by operative interference such as dilatation of the cervix, the uterus was stimulated, then in two of the cases the administration of pituitrin induced satisfactory uterine contraction, but failed absolutely in the third case. In seven other cases, when abortion had already commenced, pituitrin acted well in four but failed in the other three. It also failed in a case of hæmorrhage when the cervix was still closed. Vogt[2] also states that in cases of abortion the action of pituitrin is unreliable. In seven cases it had an apparent action in three, but in two even repeated injections failed completely. Fries[5] also found it impossible to induce abortion by pituitrin in the early months of pregnancy. In the later stages it is possible to bring on strong uterine contractions. He used it in two cases of nephritis with commencing eclampsia at the thirty-sixth and thirty-eighth weeks, and induced strong contractions. He found that with repeated doses it was only possible to bring on parturition in two cases in which he gave the drug at the very end of pregnancy, before however any spontaneous contractions had occurred. Vogt found it impossible to bring on parturition by administration of pituitrin in cases where there had been no spontaneous contractions. Hofbauer also failed to bring on abortion with pituitrin in the fourth month in a patient suffering from tuberculosis. Studeny agrees that in abortion cases pituitrin is not of much use. It did not induce abortion, and in most of the cases when abortion had already commenced or was induced by operative procedures, the only action produced by pituitrin was a slight increase in the pains. Schäfer's[6] experience with *pituglandol* was similar. Hamm goes further, and

emphatically condemns the use of pituitrin in abortion cases. Its action as an expellent was unreliable, and in four cases of septic abortion in which he used it, he noted a spastic circular constriction of the internal os which relaxed only under deep anæsthesia. All four cases occurred after repeated doses of pituitrin, in combination with operative procedures, introduction of tents, dilators, metreurynter.

The general verdict of these observers is therefore against the use of pituitrin in the treatment of abortion. Repeated injections are required, which, from the high cost of the drug, is inadvisable, as the action is unreliable.

Studeny states that the drug is inferior to ergot in controlling **Postpartum Hæmorrhage.** Jaeger and Fries confirm this statement. On the other hand, practically all observers are unanimous in affirming that when pituitrin is given during the second stage, there is no tendency to excessive loss of blood in the third stage. The expulsion of the placenta is, if anything, hastened.

Scott[7] believes that infundibulin, the extract of the posterior lobe of the pituitary body, exerts a powerful *galactogogue* action. This effect has already been noted in the lower animals, and Scott claims that the same action is seen in women.

The effect of pituitrin injections upon the **Bladder** has been specially studied by Jaschke[8] upon women who have had operations on the abdomen or uterus. His results are favourable. In twenty-one out of forty-four cases an excellent result was obtained, urine being spontaneously passed, and in 80 per cent benefit followed. It does not act well when there is cystitis. In addition to the action on the bladder he recommends the drug as a general *tonic after operations*, by its action on the cardiovascular system. The heart is slowed, but the individual beats are stronger. There is in health a moderate rise of blood-pressure, which is much greater if the pressure is low from shock. This, he thinks, is explained by the constringent action exerted on the splanchnic vessels. In shock from paralysis of the vasomotor centres, the splanchnic vessels are dilated, and blood accumulating there leads to a lowered arterial tension. Under pituitrin these vessels are constricted, consequently the blood is forced into the general circulation and the blood-pressure rises. If there has been much loss of blood, the drug does not produce a rise of pressure until enough saline solution (about 300 to 400 c.c.) is injected to replace the blood lost.

Bidwell[9] studied the effect of pituitrin injections upon **Intestinal Paresis** after laparotomy. For this purpose he tried it on twenty-one unselected cases. The drug had a very marked effect upon the muscular coats of the bowel. All patients passed flatus freely within a few hours of the first injection, often without the introduction of a tube. In only three cases did the bowels act alone, yet in all but two a satisfactory action was obtained with the aid of a simple enema. He uses the drug only during the first twenty-four hours after operation, giving three intramuscular injections of 1 c.c. each at six, twelve, and

eighteen hours after the operation. This will enable flatus to be passed freely, will prevent any flatulent distension, and will lessen the amount of aperient necessary for a thorough cleansing of the bowel.

REFERENCES.—[1]*Wien. klin. Woch.* 1911, 1496; [2]*Münch. med. Woch.* 1911, 2734; [3]*Ibid.* 2438; [4]*Deut. med. Woch.* 1911, 2286; [5]*Wien. klin. Woch.* 1911, 1766; [6]*Münch. med. Woch.* 1912, 75; [7]*Med. Rec.* 1912, i, 1248; [8]*Münch. med. Woch.* 1912, 1661; [9]*Clin. Jour.* 1911, ii, 351.

PROTHÆMIN.

Salkowski claims that this preparation represents all the albumins of the blood in a concentrated form. It is therefore rich in iron and combined phosphorus. As it is about five times as concentrated as normal blood, the iron content of prothæmin is very high, about 0·2 per cent. It is a dry, very firm powder, free from taste and odour. It is readily absorbed, and as a rule is given in doses of one to two heaped teaspoonfuls thrice daily about one hour after meals. Korb,[1] who has used it with great success in cases of **Chlorosis** and **Secondary Anæmia,** points out that not only is the blood improved both as regards hæmoglobin and corpuscles, but also there is a marked gain in weight. He dissolves the powder in cold water and then adds warm milk or cocoa to the solution.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 513.

SALINE INJECTIONS.

Hort and Penfold find that saline injections are by no means free from risk, especially when they are large. In animals, the injection of large quantities of normal or slightly hypertonic saline solutions into a vein or subcutaneous tissue is not nearly so innocuous a proceeding as is usually supposed, even though the quantities injected are, relatively to the body weight, much smaller than those used frequently for human patients. The undesirable effects noted were fever, rigors, subnormal temperatures, diarrhœa, intestinal hæmorrhages, Cheyne-Stokes' breathing, convulsions, and sudden death. The last two only occur after the use of strongly hypertonic solutions, and then, except in young animals, only when injected rapidly, and probably are not likely to occur in man. It has long been known that intravenous or subcutaneous administration of saline solution is frequently followed in man by fever. Experiments have shown that the influence of the water used for making the infusion is probably more important than the saline constituent. Distilled water alone will give rise to some of the bad effects. The quantity of fluid injected is of great importance. It has recently been suggested that the fever observed after intravenous saline injections may be due to the distilled water used in manufacturing the saline not being sterile. The experiments of Hort and Penfold, however, indicate that this suggestion will not explain all the cases. They found that with ordinary precautions the number of organisms which can be cultured from distilled water is insufficient to account for the fever. Neither centrifuging, filtration through cotton-wool or bacterial filters, nor boiling, is sufficient to

prevent the fever that follows saline injections. The only reliable method is to distil the water used in a sterile Jena retort immediately before the injection. They are unable to explain the cause of the fever. Water thus distilled if injected immediately, produced no fever, but if autoclaved in a plugged Jena flask for ten minutes at 120° F., and then allowed to stand for forty-eight hours at room temperature, it produced marked fever on injection.

[Dr. Percy Wilde has investigated a number of cases where fever or local irritation has followed sea-water or saline injection. He has found that distilled water was invariably used in preparing them. In no case has he found these symptoms when *freshly boiled* tap water was employed.—*Ed.*]

SALVARSAN. (*See also,* JOHA NEOSALVARSAN; *and* SYPHILIS.)

A good deal of attention has been directed to Wechselmann's suggestion that the unpleasant headache, fever, sickness, and cutaneous disturbance associated with the intravenous injection of salvarsan, may be due to the growth of organisms in the distilled water, which, when killed by boiling, liberate their endotoxins. It seems generally accepted that since care has been taken to use only freshly distilled water, the occurrence of these unpleasant sequelæ has been materially lessened. But recent work shows that Wechselmann's hypothesis of " water-error " does not explain all the facts. Galewsky[1] had noted the great increase in frequency of febrile disturbance, etc., after intravenous injections, and on changing the source of his saline solution found that with a purer solution the reactions became almost unknown. Stümpke's[2] experiments with injections of distilled water alone, solutions of salvarsan in the same water, and solutions of NaCl in the same water, are interesting. Whereas 250 c.c. of distilled water never produced a febrile reaction, the injection of salvarsan in the same distilled water usually caused fever with the first injection, while a second was followed by less reaction. He found that a solution of NaCl in the distilled water often produced a febrile reaction, so that he suggests that the salvarsan solution should be made not with saline solution but with plain distilled water. The experiments of Yamikoff and Kohl-Yamikoff[3] seemed strong evidence in favour of Wechselmann's contention. These investigators found that in mice, the simultaneous injection of non-lethal quantities of endotoxins, killed vaccines, and various pathogenic organisms, greatly increased the toxicity of salvarsan. If the mice were infected with slight trypanosome disease, the toxic action was more marked, even though the dose of salvarsan was sufficient to kill the trypanosomes.

Marschalko,[4] in some trenchant criticism of these results, pointed out that the organisms found active were pathogenic ones, whereas these did not grow in distilled water. He therefore carried out another series of experiments, in which he used only the organisms found growing in distilled water. He found that even the centrifuged deposit of such impure distilled water, or bouillon cultures of the

bacilli, produced no toxic phenomena when injected intravenously even in enormous doses. If the impure water or its deposit was administered with less than the lethal dose of salvarsan, the animals all survived. Evidently, therefore, the endotoxins of the bacteria contaminating distilled water are without any appreciable influence. He concludes that Wechselmann's theory of the evil effect of the bacillary bodies must be abandoned, but at the same time he believes that only freshly distilled water should be used in preparing salvarsan solutions. There is evidently some causal connection between the impure distilled water and the unpleasant reactions which follow salvarsan injections, though its exact nature has not yet been elucidated. [See note to preceding article.]

M'Intosh, Fiddes, and Dearden [5] have also investigated the rôle played by contaminated distilled water in the production of the immediate reaction after salvarsan injections. They found that the water was at fault. If special precautions were taken to ensure that it was free from bacterial contamination, saline solutions made with it produced no reaction in rabbits, and salvarsan infusions in healthy people, i.e., people not suffering from early secondary or late primary syphilis, cause no reaction. Injections of saline solution made with ordinary distilled water produce fever in rabbits. The addition of cultures of the organisms growing in ordinary distilled water to microbe-free saline solution renders it toxic, and capable of producing fever. The bacillary bodies are the cause of this fever, and not their endotoxins. The toxic effect is not due to any one variety of microbe. No increased toxicity or anaphylaxis was found to follow a second injection of the microbes. The precaution employed to ensure a microbe-free distilled water was the use of the water immediately after distillation, or redistillation of contaminated distilled water. The mechanism by which the dead bacteria exert their toxic action is doubtful ; but may be by acting as foreign proteid.

The fever which occurs in secondary syphilis after the exhibition of salvarsan in microbe-free saline solution depends probably on the liberation of endotoxins from the killed spirochætes. The " saline " rigors from contaminated saline come on more quickly than the salvarsan rigor, the feverish rise in which seldom starts till three to four hours after the injection, and we know that the spirochætes do not disappear from a chancre for four to five hours after an injection. The latent period before the salvarsan rigor is thus the time necessary to kill enough spirochætes to liberate endotoxin in sufficient quantity. Using microbe-free saline solution, it is easier to recognize the true toxic action of salvarsan. Formerly, with impure saline solution the first reaction was marked, and succeeding reactions were fainter. With the use of microbe-free saline infusions of salvarsan, as a rule the toxic symptoms, such as they are, become progressively more marked after repetitions of the injections at short intervals. This, however, is not in any sense anaphylaxis, but merely represents the cumulative effect of large doses of arsenic.

That the reactions produced by repeated salvarsan injections are not of the nature of anaphylaxis, but a toxic arsenic action, is also maintained by Zieler.[6] Though as a rule the rashes appear after a considerable interval (shorter after re-injections), this is not analogous to the anaphylactic reaction or serum sickness. It depends rather on an acquired idiosyncrasy produced by the cumulation in the body of unexcreted arsenic. This cumulation may even be seen after a single injection, as arsenic is liberated from the salvarsan. It has been suggested that the injection into the cutis of a very dilute solution of salvarsan may be of use in determining those cases likely to react sharply to salvarsan injection, but Zieler's experience does not confirm this.

Iwaschenzow[7] described a peculiar anaphylactoid reaction which he has noted in fourteen out of thirty-seven nervous cases treated with repeated salvarsan injections. The condition seems to be an acquired one, as the first injections are well borne and the phenomena are not seen till after the third or fourth injection. [It is not certain that Iwaschenzow's saline solution was above suspicion.—F. J. C.] The symptom-complex of these anaphylactoid reactions is as follows: The chief characteristic is difficulty in breathing, with simultaneous hyperæmia of the blood-vessels of the head. In some cases there is œdematous swelling of the lips, eyelids, and ears. In other cases there is pain in the loins and legs. In Wechselmann's experience the attack begins with coughing, and there may be spasmodic attacks like whooping-cough. Wechselmann[8] has discussed the condition. He points out that it may occur only once, or may increase with each succeeding injection. As a rule the symptoms are alarming while they last, but disappear in about five minutes. If he injects a very small dose of salvarsan very slowly into a patient of this character, the first complaint is uneasiness in the abdomen, with a slight flushing of the head. At the same time the pulse alters, becoming either slower or quicker. During the severe attack the pupils are dilated and do not respond to light. These attacks are seen only after intravenous, and never after subcutaneous or intramuscular injections. Wechselmann believes that they are possibly produced by the depressor nerve of the heart. The injection of other substances into the vein shows that this depressor reflex in such cases is produced only by salvarsan. Sodium chloride alone does not elicit it, and neosalvarsan can also be administered to such patients in comparatively large doses without any trouble. It seems that this form of idiosyncrasy is more apt to appear in cases where there is cerebral mischief.

Ritter[9] has studied the possibility of accumulation of arsenic in the body after repeated intravenous injection. Previous investigations have clearly shown that the disappearance of arsenic from the urine does not coincide with the total removal of arsenic from the body, as a large proportion is retained in the internal organs, notably the liver. His work proves that repeated doses of salvarsan cause some cumulative action, with retention of arsenic in the body.

Ravaut[10] has investigated the *cerebrospinal fluid* after salvarsan treatment, and states that in a certain number of cases it shows an increase in abnormal reactions. The changes are most likely in patients receiving salvarsan treatment in the secondary period. The altered reactions appear after the course of weeks or months. Of thirty-three cases treated in the secondary period, Ravaut found an increase in the pressure in fourteen, increase in the albumin content in twenty-two, and in twenty-nine an alteration in the cellular content of the fluid. He is inclined to ascribe these changes in the cerebrospinal fluid to the salvarsan. In criticizing Ravaut's paper Wechselmann,[11] concludes that there is no connection between the changes in the fluid and the drug treatment. He is convinced that salvarsan possesses no special toxic action on the nervous system, and that there is no reason to restrict its use in secondary syphilis because of any deleterious action it may produce in the cerebrospinal fluid.

Epileptiform attacks have sometimes been noted after administration of salvarsan, and in a number of cases have proved fatal. Lesser[12] has collected nine fatalities of this kind out of the literature. The usual post-mortem findings were leptomeningitis or œdema of the brain. In all probability such cases are examples of toxic salvarsan action. Probably some decomposition product is produced which may provoke either a functional disturbance resulting in temporary attacks of spasm and convulsions, or else severest cerebral irritation with coma, general convulsions, and death. Since Lesser's paper was written, Spiethoff[13] and Marschalko[14] have each reported a fatal case. Spiethoff also saw a case of severe convulsions with coma, which recovered after lumbar puncture, venesection, and purgation. Marschalko's case is specially interesting from the pathological point of view. Histological examination of the brain showed stasis, hyaline thrombosis of the capillaries, and punctiform hæmorrhage. Subsequently he produced fatal epileptiform convulsions with salvarsan in healthy rabbits, with the same histological picture.

Rat-bite Fever is a rare condition, in which the bite heals promptly, but two or three weeks afterwards the wound becomes painful and œdematous. The neighbouring lymphatics and glands are inflamed, and the patient suffers from skin rashes of various types. Every two or three days there are sudden attacks of fever ushered in with rigors. Hitherto all treatment of this condition has proved ineffectual, and the febrile attacks continue indefinitely. In a number of cases salvarsan has been used, and it appears to exert a definite action, soon cutting short the disease. Hata[15] has collected some eight cases in which its use at all stages of the disease proved satisfactory.

REFERENCES.—[1]*Deut. med. Woch.* 1911, 1743; [2]*Ibid.* 1912, 159; [3]*Münch. med. Woch.* 1911, No. 49; and 1912, 124; [4]*Deut. med. Woch.* 1912, 1222; [5]*Lancet*, 1912, i, 637; [6]*Münch. med. Woch.* 1912, 1641; [7]*Berl. klin. Woch.* 1912, 916; [8]*Deut. med. Woch.* 1912, 1174; [9]*Ibid.* 162; [10]*Presse Méd.* 1912, No. 18; [11]*Berl. klin. Woch.* 1912, 688; [12]*Ibid.* 592; [13]*Münch. med. Woch.* 1912, 1158; [14]*Deut. med. Woch.* 1912, 1222; [15]*Münch. med. Woch.* 1912, 854.

SERUM THERAPY.

Darier[1] believes that the oral administration of an antimicrobic serum is beneficial in **All Infective Conditions.** The action is more marked the earlier the treatment is given after the infection develops. He recommends as the paraspecific treatment antidiphtheritic serum diluted according to the following formula: 20 c.c. are mixed with 30 c.c. syrup of lemon and 130 c.c. of water. The dose is one tablespoonful every hour till bacteriological examination determines what is the particular form of infection to be dealt with, when either an appropriate vaccine or a serum is substituted. There is no risk of anaphylactic symptoms, and the oral administration of any serum often removes or alleviates pain, makes the patient more comfortable, stimulates his appetite, and permits sleep. In support of these contentions Darier refers to the recent work of Ruppel,[2] which shows the great value of local application of antistreptococcic serum in streptococcic infections in animals.

John[3] recommends the injection of serum or fresh defibrinated blood taken from a healthy man, in the treatment of **Pernicious Anæmia, Internal Hæmorrhages,** and **Hæmorrhagic Diathesis.** His procedure is simple. From the arm veins of a healthy man 30 to 50 c.c. of blood are removed, and defibrinated by shaking with sterile glass beads in a sterile flask for about ten minutes. The defibrinated blood is then injected into the glutei, or if that is impossible, subcutaneously into the thigh. He repeats the injection two or three times at intervals of three days. This treatment has been found useful in controlling the intestinal hæmorrhages of **Enteric Fever.** John has also used it successfully in a case of severe pernicious anæmia, and in a case of gonorrhœal rheumatism with purpuric manifestations.

Bryan[4] records a very interesting case in which he was able to test the action of a human antistreptococcic serum. A child developed streptococcic pyæmia after the Lorenz operation for congenital dislocation of the hip. Cultivation of the pus of one of the abscesses gave a pure growth of streptococcus, but polyvalent and autogenous vaccines proved of no value. Antistreptococcic serum was also used without benefit. While opening one of the abscesses, Bryan unfortunately inoculated himself, with the result that a very acute cellulitis rapidly developed. As the autogenous vaccine was in existence, he was treated with it within eight hours of the infection. The result was very successful: the temperature immediately became normal, and the infection localized. Seven days later 40 c.c. of Bryan's blood were withdrawn and allowed to clot. Next day 10 c.c. of this human specific antistreptococcic serum were injected subcutaneously into the pyæmic child, who was by this time apparently *in extremis*. Though the vaccine had not acted well, the antiserum had a much more satisfactory effect, and the general condition began to improve, while the local wounds granulated and healed up. After three days the temperature began to fall gradually to normal, and eventually the child recovered.

In opening a discussion on the scope of normal and immune serum in treatment, Horder[5] urged the trial of fresh normal horse serum in **Ulceration of the Stomach** and other organs, various kinds of **Purpura, Pernicious Anæmia, Hæmophilia,** etc. Normal serum may also profitably be used in **Infective Processes.** It is of service in most acute infections. The natural mechanism of resistance may be stimulated in a variety of ways by non-specific means. Normal horse serum at times provides a powerful stimulus to increased resistance in some infectious processes. In some cases of **Gonorrhœal Arthritis,** when normal serum proved successful, it was noted that the good response was synchronous with the time at which the so-called serum sickness occurs. It is possible that the non-specific action of normal horse serum in inhibiting the growth of bacteria or neutralizing their toxins in infective processes, is bound up with the metabolic disturbance set up about the ninth day of its administration. As regards the use of specific immune serum and vaccine, he believes that both have their value. The immune serum should be used at the commencement of the acute illness, the vaccine at the stage when the period of invasion is over and that stage is reached when there seems a delicate balance between the interaction of the antigen and the antibodies; then the judicious use of a specific vaccine is often the best means at our disposal for disturbing this balance in favour of the patient. He considers the increasing of the potency of immune sera of great importance. It has been done for antidiphtheritic serum, and will also probably be done soon for antistreptococcus and other bactericidal sera. Possibly the clamour for a polyvalent antistreptoccocus serum has gone too far. He thinks it would be better to employ potent univalent serum made with virulent strains of *Streptococcus pyogenes*, which is the type of streptococcus causing the great majority of severe and acute streptococcus infections.

Arthus,[6] in an interesting paper, brings forward strong evidence which proves conclusively that antivenom sera are specific only for the particular **Snake Poison** used in immunizing the animal from which the serum is obtained. They are in no sense active against other types of poison obtained from snakes closely allied zoologically to the specific snake.

In France, a form of **Cerebrospinal Meningitis** has been recognized by Dopter, which is clinically indistinguishable from the ordinary meningococcic disease. Etiologically, it is caused by a different organism, the *Parameningococcus*, which is not agglutinated by the serum of a meningococcic patient. Similarly, the use of meningococcic serum has no curative action, but the specific parameningococcic serum is highly active. Widal[7] reports a case which illustrates this difference very well. Whereas repeated intraspinal injection of meningococcic serum had no therapeutic action, the parameningococcic serum soon cured the patient. He advises, therefore, that cases of apparent cerebrospinal meningitis which fail to respond to meningococcic serum, should be treated with the parameningococcic serum.

Roemer-Ruppel's pneumococcic serum has been found useful by Gebb,[8] in **Ulcers of the Cornea.** Small doses are ineffectual, but with large doses (up to 300 c.c.) good results were obtained in a series of fourteen cases. In ten, the condition was cured on an average on the ninth day.

REFERENCES.—[1]*Presse Méd.* 1912, 299; [2]*Deut. med. Woch.* 1912, Feb.; [3]*Münch. med. Woch.* 1912, 186; [4]*Lancet*, 1912, i, 501; [5]*Brit. Med. Jour.* 1911, ii, 667; [6]*Presse Méd.* 1912, 9; [7]*Bull. de l'Acad. de Méd.* 1912, ii, 81; [8]*Archiv. f. Augenheilk.* lxxi, 144.

SOAPS.

Gardiner[1] considers that little advantage is gained by adding extra fat in the so-called superfatted soaps. Chemically considered, soaps are compounds of a strong alkali with a weak acid. Mixed with water, all types of soap give a strong alkaline reaction which is intensified by hydrolysis breaking up the compound and liberating free alkali. In superfatted soaps the excess of fat simply combines with the alkali. The dearer toilet and superfatted soaps show at least as high a proportion of mineral oil and alkali as the coarser types of soap.

Any alkaline solution applied to the skin induces excessive secretion of acid sebum and sweat, and exerts a solvent or softening effect on the protective epithelium. Thus, from their chemical constitution all soaps must be irritant to the normal skin, the effect varying with the individual skin but being more pronounced in senile or diseased skins. The more irritant action of cheaper soaps is due to the use of cotton-seed oil and other rancid oils which are now more used than formerly in manufacturing cheap soaps. Resin and impurities have no special significance from the point of view of skin irritation, but the introduction of benzene and paraffin derivatives into soaps used for cleansing clothes increases the skin-irritating properties of the soap. Soaps, even when they contain antiseptics, possess no germicidal properties, and the antiseptics may increase the irritation produced by the soap. Such substances as sulphur and ichthyol may exert an action on the blood-vessels and glands. Gardiner concludes that the minimum of soap should be used and well washed off.

REFERENCE.—[1]*Edin. Med. Jour.* 1912, i, 514.

SODIUM SALICYLATE.

Heyn[1] states that sodium salicylate is well borne by the rectum, and that it may be so given even when oral administration causes gastric disturbance. After a cleansing douche of plain water, from 2 to 4 dr. of sodium salicylate are incorporated with 6 oz. of starch water, to which are added ten drops of tincture of opium. In some cases a single injection has been sufficient to produce entire cessation of all symptoms of **Rheumatic Fever,** but as a rule daily administration of the drug is required. Beatty[2] also recommends this method

of administering sodium salicylate in the **Influenza of Infancy.** He uses a cleansing enema, and then introduces a suppository containing quinine and novaspirin made up with a theobroma base.

References.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1013; [2]*Med. Rec.* 1912, ii, 199.

TARAXACUM.

Robson[1] states that he has been systematically giving taraxacum, 1 to 2 dr. of the liquid extract, thrice daily, in three cases of **Cancer,** with apparent benefit. His patients have gained in weight and are free from pain.

Reference.—[1]*Brit. Med. Jour.* 1912, i, 1181.

THORIUM. (*See also* Radium and Allied Substances.)

Thorium gradually changes into mesothorium, radiothorium, and finally into thorium *X*, which gives off emanations indefinitely. A solution of thorium *X* in physiological salt solution has been used clinically. Injected subcutaneously it causes a great diminution in the number of leucocytes in the peripheral blood. Falta, Kriser, and Zehner[1] have tested this action in cases of severe leukæmia, and found it so far satisfactory that with increasing doses of from 50,000 to 100,000 maché units, the peripheral leucocyte count fell and the general condition improved. They did not observe any unpleasant side-effects, but Gudzent[2] has reported a case of thorium poisoning from thorium *X* injections. The patient, a very corpulent young woman, aged twenty-three, suffering from chronic arthritis, received three injections of thorium *X* in sixteen days, and a single injection of thorium *A*. Four days after the fourth injection she had slight nausea and lumbar pain. These symptoms increased during the next few days, the patient becoming very weak and in great abdominal pain. Diarrhœa set in, which became so severe that by the tenth day after the last injection the stools contained blood. Then she began to vomit blood, and death occurred with symptoms of increasing heart failure. The comparatively late onset of the symptoms, and the hæmorrhages from the gastro-intestinal tract are characteristic of thorium poisoning, as was found by Orth in experiments on animals.

References.—[1]*Wien. klin. Woch.* 1912, No. 12; [2]*Berl. klin. Woch.* 1912, No. 20.

THROMBOKINASE.

Strong[1] uses thrombokinase prepared from sheep's lungs, and finds that it hastens the clotting of healthy rabbit blood in test-tube experiments. Clinically, he has obtained good results from the local application of dry thrombokinase powder to the bleeding points, in cases of sporadic or hereditary **Hæmophilia.** The mode of preparation is as follows: After removing the larger bronchi, the fresh lungs are treated in a meat grinder, and soaked in twice their volume of sterile water for an hour. On adding, drop by drop, 1·5 c.c. of glacial acetic acid for

each litre of extract, with constant stirring, a flocculent precipitate results, which is removed by centrifuging, and washed free of acid with saline solution. It is dehydrated by mixing with alcohol and centrifuging, drying being completed on evaporating-dishes at a low temperature in vacuo. As a rule this takes about twelve hours. The powder is then kept in sterile sealed tubes.

Reference.—[1]*N.Y. Med. Jour.* 1912, i, 591.

THYMUS GLAND.

Keeley and Beebe[1] report an interesting case of improvement following administration of thymus gland, gr. 15 thrice daily, to a boy suffering from **Arrested Sexual Development** and deficient growth. The patient, aged sixteen and a quarter years, had made no perceptible growth for two years. His genitals were small and undeveloped, the testicles resting in the canal. There was no pubic or axillary hair. During the first six months of thymus treatment, the genital organs perceptibly enlarged, and after nine months the first erection occurred. In twelve months hair appeared in the axilla and on the pubis. He had grown one inch, and had gained eleven pounds in weight. During the next six months he grew another two inches and gained another eight pounds, and the sexual organs became apparently normal.

Reference.—[1]*Amer. Jour. Med. Sci.* 1912, ii, 219.

TUBERCULIN.

After investigating the effect of administering tuberculin by the mouth, Möllers and Heinemann[1] come to the conclusion that this method is of no value for either diagnostic or therapeutic purposes.

Reference.—[1]*Deut. med. Woch.* 1911, 1825.

TURPENTINE.

Pic[1] recommends the use of turpentine injections to produce an "abscess of fixation" in **Erysipelas** where there is clinical evidence of streptococcæmia in addition to the local condition. This rather heroic method of treatment can be used for both adults and infants. It is said to produce an excellent effect upon the general condition of toxæmia, and also to check the local disease.

Reference.—[1]*Rev. de Méd.* 1911, 612.

TYROSAMINE, TYRAMINE.

Under the name systogen, a tyrosamine or paraoxyphenylethylamine, prepared from tyrosin, has been used. It seems to correspond to tyramine. Heimann[1] has used it extensively in **Midwifery** cases. He employs a 0·2 per cent solution of the hydrochloride. One c.c. of the solution contains 2 mgrams of active substance and corresponds to 30 gr. of fresh ergot. The average dose of the solution was $\frac{1}{4}$ to $\frac{1}{2}$ c.c. for subcutaneous injection, and 3 c.c. by the mouth. He finds that it acts promptly, without any unpleasant or toxic action. The

contraction of the uterus is quicker than with ergot, and the patient has no after-pains. It proved an effectual remedy for retention of membranes. After cleaning out abortions, and curettage, a single injection is sufficient to cause efficient contraction of the uterus.

REFERENCE.—[1]*Münch. med. Woch.* 1912, 1370.

UREABROMIN.

A new bromide compound has been introduced under this name. It is a combination of urea bromine and calcium, with the following composition, $CaBr_{24}CO.(NH_2)_2$. It occurs as a white powder, or glistening, colourless, and odourless crystals. The taste is cool and somewhat bitter. It is hygroscopic and readily soluble in water or alcohol. The content of bromine is 36 per cent. Investigation showed that in health the bromine portion is more rapidly excreted than that of the alkaline bromides. The compound also favours the absorption of calcium, so that after its administration the calcium content of the urine rapidly increases.

Fischer and Hoppe[1] used it in **Spasmodic Affections of Children,** and found that for five to six weeks the new drug increased the calcium content to normal, with diminution in the spasmodic attacks, but after this time the calcium content of the blood became irregular, and then the spasms returned. The useful period during which the drug can be administered is therefore about six to eight weeks. Similarly it acts very well in **Chorea,** in which condition they find also a diminution in the blood calcium. In **Status Epilepticus** intravenous injection of ureabromin gives more rapid relief than any other remedy. As the new compound has a diuretic action, its use is recommended in all **Epileptic** conditions in which (1) the urinary excretion is diminished; (2) the heart is depressed, as it is found to strengthen the pulse and make it regular; (3) there is reason to suspect an intoxication either from the bowel or kidney; or (4) wherever there is a tendency to spasm. The average dose found useful by them is two to three dessertspoonfuls daily of a solution of 40 grams in 300 c.c. For children, half this quantity is required. For rectal injection in status epilepticus, at least 6 grams are required. As an intravenous injection, 4 grams can be administered in a solution of the same osmotic pressure and alkalinity as the blood.

REFERENCE.—[1]*Berl. klin. Woch.* 1911, 1833.

URETHANE.

Bertling[1] states that urethane is a useful drug for young children. It is a certain and apparently safe hypnotic, and as such may be used to alleviate excessive **Restlessness** during the day, or to overcome **Sleeplessness** due to nervous causes or slight pain. It is also of value in reducing the number of attacks in **Whooping Cough,** and enables the child to get an hour or two of undisturbed sleep. It is specially valuable in overcoming the spasmodic attacks which sometimes

persist for months after the disease has run its course. Lastly, it is of great value in quieting convulsions and spasmodic conditions arising from toxic causes. The drug is cheap, but requires to be given in fairly large doses. For children the following doses are advisable: one to five months, 0·5 to 0·9 grams; six to twelve months, 1 gram; one to two years, 1·5 gram; over two years, 2 grams.

Reference.—[1]*Berl. klin. Woch.* 1912, 147.

UZARA.

This plant belongs to the asclepiadaceæ, and is used in certain regions in Africa as a remedy for **Diarrhœa.** The pharmacological investigations of Prof. Gürber[1] indicate that it is possessed of valuable properties, having a manifold action upon various parts of the body. It acts upon both the central and peripheral nervous system, on the heart and blood-vessels, the white blood corpuscles, and on the motor mechanism of the intestinal tract. It first stimulates and then depresses the central nervous system, paralyzing nerves and nerve endings. Its action on the heart is inhibitory through increase of the vagal tonus, and it also has a direct action like the digitalis bodies, causing systolic arrest. The blood-pressure is greatly increased, partly by a direct action on the arterial tonus and partly by an action through the vasomotor nerves. These results are, however, not easily produced when the drug is given by the mouth, as its absorption is difficult. The rectal absorption is rather more active, but even here is so slight that the drug can quite safely be used in the form of suppositories. Amœbæ and leucocytes are characteristically affected by contact with a 1–10,000 solution of the drug. After a first stage of increased movement, with active formation of pseudopodia, the organisms flatten out and rapidly die. Possibly this toxic action on amœbæ may explain the utility of the drug in **Dysentery.**

Clinically, the most important action of the drug is that on the intestinal tract. It acts very promptly as an antidiarrhœic remedy, relieving spasm, colic, and diarrhœa. There is no after-constipation. In many cases the drug relieves the distress but does not diminish the number of the evacuations nor change their liquid nature. Its action on amœbic dysentery seems to be specific.

Reference.—[1]*Münch. med. Woch.* 1911, 2100.

VACCINES.

Besredka's method of sensitizing vaccine has given very good results, especially in the prophylactic immunization of animals, while it also appears to have some curative action. Gordon,[1] in a critical review, shows this method to be based upon the observation of Ehrlich and Morgenroth that a cell brought into contact with its specific antibody fixes it to the exclusion of every other substance which may be present. He uses this property to fix the specific antibody to the vaccine, thereby excluding the serum and toxins contained in it. Briefly, the procedure is as follows: The serum of an immunized animal

is brought into contact with an emulsion of the micro-organisms, and after contact for twelve hours the vaccine has absorbed the antibody. By repeated washings in saline solution, with subsequent centrifuging, all traces of the serum are removed, and a pultaceous deposit of bacterial bodies with their specific antibodies attached is obtained. Though most workers now proceed to kill the sensitized micro-organisms, this is perhaps not necessary, though it is safer. Sensitized vaccine keeps well if there is no excess of saline left. Sensitization greatly reduces the toxicity of a vaccine and eliminates practically all local or general reaction when it is injected. Immunity is much more rapidly established with a sensitized than an ordinary vaccine, and lasts as long.

In animal experiments, the use of sensitized vaccines has given excellent results as a prophylactic measure against infection with pneumonia, plague, cholera, dysentery, tubercle, and streptococcal infection. Alcock has used living sensitized **Typhoid** vaccine in forty-four cases in man, giving two subcutaneous injections, first 1 c.c. of 1 per cent dilution of a twenty-four hours' peptone-free agar culture of *B. typhosus*, followed eight to ten days later by 2 to 3 c.c. of the same preparation. This proceeding seems harmless, and the living sensitized bacilli produce less local and general reaction than the same dose of typhoid bacilli killed but unsensitized. Thus in chimpanzees it has been found that the sensitized vaccine protects against infection by the alimentary canal, whereas Vincent's vaccine made by killing an emulsion of the germs with ether without sensitization failed to give protection. Vincent,[2] however, reported two cases in man, where by inadvertence living cultures of virulent typhoid germs were swallowed. In the one instance the victim had four months previously been immunized by vaccine of living germs killed with ether. He did not develop typhoid fever. The second case occurred in an unimmunized man who promptly was thoroughly treated with unsensitized vaccine, and though he had a severe reaction, he also escaped without developing typhoid fever.

It appears, therefore, that the method of sensitization will in the future prove of great importance as a rapid and safe means of producing active immunity, as it seems to eliminate the negative phase to a large extent. According to Besredka, the main effect of the sensitization is to activate and accelerate the work of the leucocytes.

Two interesting reports have recently been published which indicate that vaccine therapy is of value in **Puerperal Fever.** Western[3] utilized a series of 100 cases of severe puerperal sepsis treated in the London Hospital. The total mortality was 43 per cent, but 56 cases treated with vaccines had a mortality of 32 per cent, while 55 per cent of the 24 cases not receiving vaccine therapy died. The same result is seen when the cases are considered in which bacteriological evidence of a blood infection was present. Of 27 inoculated cases, 14, or 52 per cent, died, whereas of 16 uninoculated cases, 14, or 87·5 per cent, succumbed.

Western used autogenous vaccines, but Rowlette's[4] report from the Dublin Rotunda Hospital shows that stock vaccines also act well. His series includes 31 instances of streptococcal and 8 of staphylococcal infection. Speaking of the streptococcal cases, he states that inoculations certainly did no harm, and in a fair number of cases it was possible to say that their effect was definitely good. In the majority, the injection was followed by amelioration, and in some the definite fall of temperature was very striking. In some cases vaccine therapy seemed to prevent the infection assuming a dangerous development. The average number of inoculations required for the streptococcic cases was 3·3, and the dose was either $2\frac{1}{2}$ or 5 million. In a few cases the larger dose acted where the smaller one had failed. Of course all ordinary methods of treatment were used in addition to the vaccine therapy. Rowlette concludes that vaccines in small doses do no harm, and in the great majority of cases do good, in many instances producing immediate and remarkable improvement. Autogenous vaccines are more trustworthy than stock vaccines, and sometimes succeed rapidly when the latter fail. Antistreptococcic serum given simultaneously increases the effect of vaccine therapy.

Callison[5] has treated 38 cases of **Typhoid Fever** with vaccines, with good results. The mortality was five, death being due to femoral phlebitis, double pneumonia, meningococcus septicæmia, ruptured spleen, and asthenia. He states that vaccine treatment has an undoubted effect upon the course of the disease. The benefit begins about four to six days after the injection, i.e., at a period in which, in prophylactic inoculation of healthy individuals, there is a rapid development of opsonins and agglutinins. The first effect is an improvement in the general condition and appearance of the patient, the typhoid facies is lost, appetite improves, and more interest is taken in the surroundings. The temperature falls to normal in two or three days. Convalescence is rapid, while relapses and complications are fewer. The initial dose is 500 million, increasing by 100 million every fourth day as long as is necessary.

Potter[6] states that he has observed fair results from the use of a vaccine of *Micrococcus neoformans* in **Cancer.** His observations are based on twelve cases, all inoperable, and some at advanced stages of the disease. In three no benefit, local or general, was obtained; but the other nine showed some improvement. The most consistent effect was the relief of pain, which was noted to a greater or less extent in each case. The general health was also much improved in most. There was regaining of weight, appetite, and strength, and loss of characteristic cachexia. On stopping the vaccine, the patients became restless, pain returned, and appetite and strength failed. No diminution in the size, or change in the consistency, of tumours of internal organs could be detected, but in **Rodent Ulcer** the ulcerated area became clean, healthy granulations formed at the edges, and the disease seemed arrested. In **Cancer of the Uterus** the decrease in the

malodorous discharge and bleeding was marked and lasting. The initial dose employed was from 25 to 100 million, increasing to 200 million, either once or twice weekly, or every three days, depending upon the length of time the positive phase lasted.

Risley[7] has tested the Gilman-Coca method of treating **Cancer** by injections of a vaccine consisting of an emulsion of the living tumour cells of the patient removed at operation. The tumour was taken in sterile towels, and kept in cold storage for twenty-four hours until partially frozen. After removal of fat and connective tissue, the tumour was cut up into very fine pieces, ground with a small quantity of saline solution, the emulsion strained through fine gauze, and kept on ice till used. In this way an emulsion of fairly uniform strength was obtained, containing finely divided masses of cells. Unfortunately the clinical results from its use were strikingly negative as regards cure, and yet it seemed to stimulate the tumour to grow actively. He concludes that the emulsion cannot retard the growth of inoperable cancers, or prevent recurrence in cases operated on, while in a great proportion of the cases the growth of the tumour is stimulated. There is also danger of sepsis, which is in no wise beneficial to the patient.

Polak[8] has used vaccines in **Pelvic Infections.** His impressions are on the whole favourable. In **Thrombophlebitis,** in colon-bacillic and mixed **Pyelitis,** and as an adjunct to incisions in **Mastitis,** vaccines have proved their value beyond question. He treated thirty-one cases of streptococcic **Metritis** of septic origin, following abortion, labour, or intra-uterine instrumentation. In all, a marked increase in leucocytic resistance was noted immediately after the injection. Three patients died of general peritonitis; ten developed a streptococcæmia, which cleared up under the continued use of polyvalent strains of streptococci. Eleven out of twelve cases of staphylococcic bacteriæmia recovered under vaccine treatment alone. Six out of twenty-eight cases of streptococcæmia ended fatally. Autogenous streptococcic vaccine increased the leucocytic resistance less than polyvalent stock or mixed vaccines. Thirty-seven cases of thrombophlebitis of pelvic or femoral veins proved that vaccine therapy with mixed polyvalent strains arrests the thrombophlebitic intention, and hastens recovery. Of the forty-eight cases of pyelitis, fifteen were complicated with pregnancy, yet all recoverd with mixed vaccines of *B. coli*, *Streptococci*, and *Staphylococci*, along with hexamethylenetetramin, postural treatment, and copious drinking of water. The mixed vaccines acted much better than coli vaccine alone, and the colon bacillus could be demonstrated in the urine even after all general symptoms and local tenderness had subsided.

Hitchins[9] finds that the use of a mixed vaccine containing *Staphylococcus aureus* and *albus*, *Streptococcus*, *Pneumococcus*, *Micrococcus catarrhalis*, and the bacillus of Friedländer, is a simple, direct, and specific treatment for **Acute** and **Chronic Catarrh of the Respiratory Passages.** Dabney[10] states that vaccines abbreviate the convalescence

in acute and subacute **Otitis Media,** stubborn slowly-healing **Sinuses** following mastoid operations, **Tonsillar Infections,** and **Furunculosis** of the auditory canal.

REFERENCES.—[1]*Quart. Jour. Med.* 1912, 509; [2]*Bull. de l'Acad. de Méd.* 1912, i, 374; [3]*Lancet,* 1912, Feb. 10; [4]*Jour. Obst. and Gyn.* 1912, 319; [5]*Amer. Jour. Med. Sci.* 1912, ii, 350; [6]*Med. Rec.* 1911, ii, 1075; [7]*Bost. Med. and Surg. Jour.* 1911, ii, 784; [8]*Jour. Amer. Med. Assoc.* 1911, ii, 1758; [9]*Med. Rec.* 1912, i, 317; [10]*N.Y. Med. Jour.* 1912, i, 273.

VENESECTION.

Fortescue Fox's[1] cases show the value of bloodletting in **Acute Pyrexial Diseases** of a sthenic or fulminating character with dangerous nervous or circulatory excitement, e.g., to relieve the pain of very acute pleurisy and to reduce the violence of the inflammation in pneumonia. It has been found that small bloodlettings increase the production of antibodies. In **Toxæmias,** uræmic or otherwise, resulting in sudden attacks of dyspnœa, coma, or convulsions, even small 6- to 12-oz. venesections give prompt relief. In **Threatening Asphyxia** and cyanosis, or dangerous circulatory embarrassment in heart disease, thoracic aneurysm, bronchitis, and carbonic acid poisoning, venesection relieves the right heart, removes cyanosis, and reflexly appears to relax the arteries and lower blood-pressure. Life seems to have been saved in cases of **Cerebral Hæmorrhage,** and venesection is indicated in threatened rupture of a cerebral vessel. Many of the emergencies for the relief of which venesection may be properly employed, occur in persons who suffer from **Chronic Arterial Hypertension.**

REFERENCE.—[1]*Lancet,* 1911, ii, 1258.

RADIO-ACTIVITY AND ELECTROTHERAPEUTICS.

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Whilst no great advance has taken place during the past year in *x*-ray work or in the field of electrotherapeutics, good work has been done in advancing technique, and in many additions to the diagnostic value of radiography, more especially in gastric and intestinal conditions. The section on electrotherapeutics at Liverpool was well attended, and the discussions on radium and ionic medication added largely to the knowledge of these subjects. At the annual Congress of the German Röntgen Society at Berlin the recommendations of Albers-Schönberg regarding the status of Röntgenology were carried unanimously. The chief points were that Röntgenology should be recognized as a duly authorized medical speciality ; that the Röntgenologist is a medical specialist and should, as a consultant, alone decide upon the method of examination, etc. ; that all plates, screen drawings, and so on, are the absolute property of the Röntgenologist.

X-RAY DIAGNOSIS.

Gastro-Intestinal Conditions.—Various substances have been tried as a substitute for carbonate of bismuth for making the examination of the stomach, etc. The only disadvantage of the bismuth salt is the price, about 10s. per pound. Of the substitutes probably barium sulphate is the best, and its cost is about 1s. 6d. per pound. The insoluble barium sulphate used must be absolutely pure, as the other barium salts are not insoluble, are absorbed, and are extremely poisonous. Merck prepares a pure salt, guaranteed innocuous for *x*-ray purposes, and it can be used in the same manner and amount as the bismuth. The *formula*[1] given is : Boil together barium sulphate (Merck) 5 oz., mondamin ½ oz., sugar ½ oz., cocoa ¾ oz., water 18 oz. The amount of barium may be safely increased up to 40 per cent. We have found the meal equally efficacious if from 4 to 6 oz. of barium sulphate are added to about one pint of bread and milk made exactly like thick bread sauce, and well stirred in.

For *intestinal injection* (Haenisch), take 500 grams of warm water and thoroughly mix it with 300 grams of kaolin, add 150 grams of barium sulphate, and stir well, then add 500 more grams of warm water, and finally 150 more grams of the barium. To inject, introduce a soft rectal bougie a few inches into the rectum, to the outside end of this attach a few inches of glass tubing—this to

enable the injection to be seen—and to this, india-rubber tubing leading to a douche can. Place the barium solution in the can, and raise it to allow the injection to flow. The patient is lying on a couch with the *x*-ray tube below, and the inflow is watched on the fluorescent screen; then by lowering the can, the injection will flow from the bowel, and thus any abnormal condition can be studied with the solution flowing both ways.

In making the examination of the *stomach*, Holzknecht[2] endeavours to group a number of radiological and clinical signs under one "symptom-complex," so as to show their true diagnostic value in stomach disease.

He draws up fifteen groups, each of which indicates a different condition. To show his method we will quote two groups:—

"*Symptom-Complex I.* (1) Bismuth residue six hours after meal; (2) Normal shadow of stomach seen on the screen; (3) Achylia. *Diagnosis*: a small carcinoma of the pylorus."

"*Symptom-Complex II.* (1) Small bismuth residue after six hours; (2) Sensitive pressure point and resistance in the pars media; (3) Transverse contraction of the pars media; (4) Diverticulum without an air-bubble in the small curvature, immovable. *Diagnosis*: a callous ulcer of the small curvature of the pars media."

He lays great stress upon the importance of hyperacidity or otherwise, and many of the *x*-ray diagnoses are based entirely upon the *x*-ray findings plus or minus the acidity. Thus in Symptom-Complex I. above, the diagnosis is made because (1) As long as the pylorus is free, achylia is always associated with hypermotility, i.e., an empty stomach in from two to three hours; (2) A residue after six hours must mean organic obstruction, and (3) Spasm of the pylorus is never associated with achylia but with hyperacidity.

This paper is based upon the stomach examination by Handek's double-meal method; that is, a bismuth meal is given at 7 a.m., and the stomach is examined at 1 p.m. for residue or otherwise, and the bowel for the position of the meal. A second watery suspension of bismuth is then given, to see the size, shape, and motility of the stomach itself. This method allows of the whole examination being made at one sitting; on the other hand, after giving it an extensive trial, we have found that it is by no means applicable to all cases and is often misleading; furthermore, if the examination of the bowel is required in addition to that of the stomach, the double meal is obviously often disadvantageous. Holzknecht[3] has a further paper on this method with some very interesting diagrams. Dealing with the duodenum, he points out that the first part is early filled with the bismuth food and remains visible during the whole period of digestion, and therefore gives the position of the pylorus much more accurately than the peristalsis of the antrum. In a third paper[4] he further develops his theories of stomach examination, especially from the point of view of the position and shape of residues of food after varying intervals, and the deductions to be drawn from various alterations in the shape of

the bismuth food shadow of the stomach immediately after the meal. These three papers, together with one by Handek,[5] insist very emphatically on (1) The value of the observation of the bismuth meal at different times ; (2) The meanings of the various observations made ; (3) The great importance of relying not upon the *x*-ray observations alone, but also on the chemical nature of the stomach contents, the history of the case, and palpation of the stomach at the time of the *x*-ray examination.

Hour-glass Contraction is very fully dealt with by Knox[6] in a detailed review of two cases, with illustrations and diagrams. He points out that the symptoms may simulate stenosis of the pylorus, and that the only satisfactory means of diagnosis is the *x*-ray examination ; this puts the case beyond question, shows the exact size, shape, and position of the stomach, the amount of contraction and the size of the pouches, and whether there is or is not pyloric obstruction in addition. Hertz[7] regards the *x*-ray diagnosis of hour-glass stomach as one of the greatest triumphs of radiography. Functional hour-glass contraction can be recognized only by *x*-ray examination, as it does not exist either at operation or on the post-mortem table. He describes in detail three forms : (1) Spasmodic ; (2) Orthostatic ; (3) Due to adhesions ; and contrasts them with the organic condition. There is no difficulty in making the differential diagnosis by means of bismuth and *x*-rays. It is important to look at the stomach with the patient both lying down and upright. Desternes[8] also lays great stress upon the necessity of the examination of the stomach in both positions, as bearing upon the exact situation of the organ, its form, contractility, and mode of evacuation. He insists that the horizontal position accelerates evacuation, and that he possesses radiographs proving this.

Duodenal Ulcer, according to Kreuzfuchs,[9] is always accompanied by increased motor activity of the stomach ; and the result of *x*-ray investigation is to transfer the emphasis from the treatment of hyperacidity to that tending to diminish motor activity. The exact site of the pain, and whether it corresponds exactly to the duodenum or not, can be tested by observing the painful pressure-point upon the fluorescent screen.

Cole[10] discusses in detail the radiological study of the pylorus and duodenum, expressly with regard to the first part of the latter, which he considers should be regarded as a part of the stomach. He applies the term " cap " to this portion, and states that it varies in size, shape, and position, and that the normal cap can be differentiated from the pathological. He advocates, for diagnostic purposes, the passage of an " Einhorn pyloric dilator." This is a small metallic ball and rubber bag attached to a fine rubber tube, the rubber bag collapsing round the tube just behind the ball. The whole apparatus can be swallowed like a pill. After swallowing, an interval is allowed for it to enter the duodenum, when it is inflated with air and acts as an obstruction. Following this, a bismuth meal is given and its passage noted.

PLATE I.

SKIAGRAM AFTER A BISMUTH MEAL

Twenty-five and a half hours after a bismuth meal. The appendix is shown full of food and forming two loops, one or both possibly coiled round the small bowel and thus causing delay. **A** = Transverse colon. **B** = Cæcum and ascending colon. **D, E** = Appendix. **C** = Food delayed in small bowel.

C. Thurstan Hollana

Jordan[11] adds to the knowledge of **Intestinal Stasis,** in a well-illustrated paper. Visceroptosis causes a drag upon the mesentery, in which thickened bands form as a result; these bands are often strong in some places and weak in others, consequently the bowel is held up at certain points and kinks are produced. These kinks can be diagnosed by radiography, as the author's radiographs show (*Plate I*). It is pointed out that duodenal kinks are intermittent in character, and often disappear when the patient lies down. In a good many cases bismuth food enters the appendix, which can thus be seen; pressure can then be made on it, and its tenderness or otherwise determined. Further, fixity of the appendix can also be demonstrated. Arbuthnot Lane[12] confirms Jordan's observations, and maintains that they have been of the greatest service in confirming his views, and in demonstrating chronic intestinal stasis and its causes. Taking an opposite view, Lockhart Mummery,[13] recording 30 cases of constipation treated by operation, has no faith in the *x*-ray diagnosis of intestinal kinks without other evidence, and does not believe that ileal kinks so shown are necessarily pathological or cause any symptoms.

Hertz[14] has never observed true stasis in the duodenum except in cases of organic obstruction, and to a less extent in extreme gastroptosis, in which a kink may occur at the point where the duodenum is fixed. He is convinced that kinking plays no part whatever in the etiology of duodenal ulcer; nor does he believe that ileal kink is of any importance in the causation of simple constipation. His *x*-ray investigations have shown that all cases of constipation fall into two groups: (1) Delay in the passage through the colon, defæcation being normal—"intestinal constipation"; (2) "Dyschezia," in which the passage through the colon is normal, but defæcation is inefficiently performed.

Other interesting *intestinal conditions* are described by other authors Muenet[15] describes an obscure case in which the diagnosis was cleared up by an *x*-ray examination, this showing that the patient had a gastro-colic fistula. Pyloric obstruction was present, and all the food passed straight from the stomach into the colon. A gastro-enterostomy cured the patient, and later on another *x*-ray examination showed that the old fistula had ceased to act. Desternes[16] describes a case of **Appendix Disease,** when the operation showed the condition to be exactly that suggested by *x*-ray examination. The author thinks that sometimes *x*-ray examination will make it possible to eliminate the diagnosis of appendicitis in certain cases. Schwarz[17] has diagnosed **Stenosis of the Small Intestine** by *x*-rays. He quotes two cases: Stenosis (1) By scar tissue; (2) From metastatic carcinoma; and discusses the value of *x*-rays in these cases as sometimes affording the only proof as to the exact position of the obstruction. Pirie[18] describes how by an *x*-ray examination he found accidentally, and made the diagnosis of, a **Hernial Sac.**

Barclay[19] confirms the observations of Holzknecht on the movements of the food in the large intestine, having not only seen but actually radiographed the food shadow passing through some 12 inches of large

intestine in a fraction of time. He believes this proves that the haustral segmentation of the bismuth-mixed fæces in the colon is not due to scybalous formation, but to a condition of tonic contraction of the intestine upon the fluid fæces.

Giffen[20] publishes a paper on the diagnosis of **Diaphragmatic Hernia,** with *x*-ray illustrations of one case, before and after a bismuth meal, and at various intervals after an operation. The radiographs showed a curved line above the diaphragm, with a very translucent area between the two, and a bismuth meal definitely proved what was the exact condition.

The results of recent advances in technique, which have made it possible to obtain a pair of *stereoscopic radiographs* of the bismuth-filled stomach and intestine in less than one second, can be seen in a paper by J. T. Case,[21] with a series of very fine stereoscopic pictures. In these pictures the relative position of the different parts of the bowel can be beautifully seen, and the exact curves of the splenic and hepatic flexures. Mr. Case has kindly supplied the two accompanying Plates, with their explanatory notes. [No doubt such radiographs of cases of kinks of the duodenum and ileal kinks would settle once and for all whether these kinks do or do not exist.—C. T. H.]

PLATE II.

Stereoradiogram showing stomach, colon, and terminal ileum in a case of ileal adhesions. Note the dilated ileum, reaching up out of the pelvis with the constricted three or four inches of terminal ileum separating the dilated ileum from the cæcum.

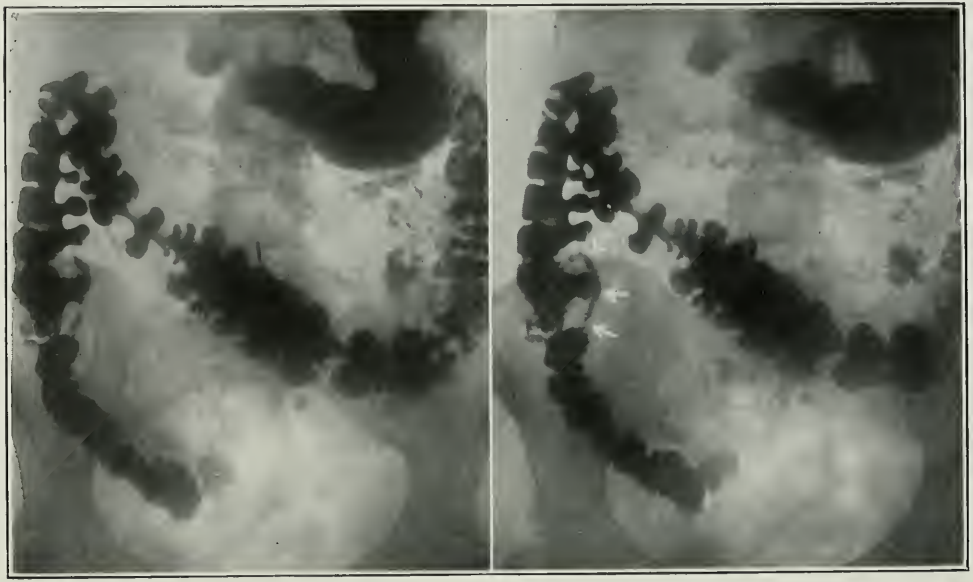
PLATE III.

Stereoradiogram of the pelvis, showing the pelvic colon, the cæcum, and a fistulous tract between the lower angle of an old appendicectomy wound and the sigmoid. The fistula was filled with Beck's paste, a considerable mass of which passed into the sigmoid (note the denser shadow). The colon was then injected in the usual manner. The patient underwent an appendicectomy some years before, followed by long suppuration and the formation of a fistula. Note the ease with which the fistulous tract can be followed from the skin to the bowel. Observe the subcutaneous blind pouch branching off toward the suprapubic region. The opening of the fistula into the skin is indicated by F.

A discussion on the anatomy of the normal stomach was opened at the British Medical Association Meeting at Liverpool by Hertz,[22] who pointed out that *x*-rays have shown the absolute fallacy of attempting to map out the shape and position of the stomach by means of percussion or auscultatory percussion; also that modern surgery has added practically nothing to the knowledge of the normal stomach, inasmuch as the stomach seen on the operating-table hardly differs from that seen in the dissecting-room. This paper is a very comprehensive account, with diagrams, of the *x*-ray appearances of the normal stomach (1) empty, (2) half-filled, and (3) full. H. J. Stiles,[23] in discussing this paper, very pertinently remarked that "it was quite time that anatomists and clinicians should teach the student the *x*-ray appearances, because, after all, these were in many respects more

PLATE II.

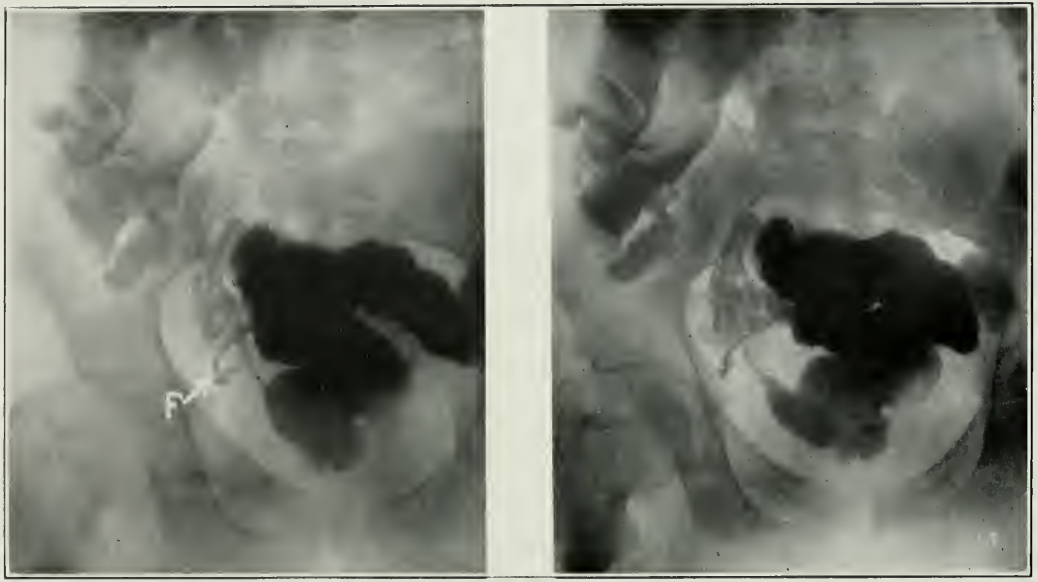
STEREORADIOGRAM SHOWING BISMUTH FILLED STOMACH AND INTESTINES



Kindly lent by Dr. J. T. Case, Battle Creek, Michigan

PLATE III.

STEREORADIOGRAM SHOWING BISMUTH-FILLED INTESTINES



Kindly lent by Dr. J. T. Case, Battle Creek, Michigan

important than the appearances seen in the dissecting-room or on the operating-table."

Pulmonary Disease.—Under the title of **Peribronchial Phthisis,** Jordan[24] publishes two papers. He attempts to prove by the radiographic examination of the living cases, and by a similar examination of " healthy lungs " found in the post-mortem room, that, in the large majority, tuberculous infection begins at the roots of the lungs, and extends along the branches of the large bronchial tubes, and in this inaccessible position will often escape detection by the ordinary physical examination. From the roots of the lung it spreads with greater or less speed to an apex, which is rapidly involved, so that it soon appears, clinically, to be the chief seat of the invasion.

He made an *x*- ray examination of 36 " healthy lungs " from the post-mortem room, mostly from cases of accidental death ; these lungs had been incised and passed as healthy by the pathologist. In 25 cases there were radiographically gross calcareous deposits in the bronchial glands, etc., and in 11, small calcareous fragments ; in many there was a large excess of fibrous tissue around the main branches of the bronchi. Jordan states that the calcareous deposits represent obsolete tuberculosis, and the fibrous tissue around the air-tubes represents healed tuberculous bronchopneumonia.

One case of early pulmonary infection died rapidly from other causes : during life and before there were any clinical chest signs, a radiographic examination of the chest had been made, which showed a well-marked patch of peribronchial phthisis, the apex being quite clear. Later on other radiographs were taken, which showed progress in the disease on both sides, still peribronchial in character. Post mortem, sections were cut through the entire lung ; about one in every twelve sections was kept, and thus a complete series of representative sections through each lung was obtained. These, and the *x*-rays, were compared point by point, and proved that the disease had commenced in the roots of the lung and spread radially, but most rapidly, along the larger air-tubes.

Urinary Tract.—For the early diagnosis of **Intermittent Hydronephrosis,** Fowler[25] advocates early examination by ureteral catheterization and injection of collargol. He often injects the sound kidney as well, and finds that the patients always differentiate the pain as being wholly different from their attacks. The normal kidney pelvis should hold 10 c.c. By injecting collargol into the affected kidney, the same kind of pain is induced as when the attack is caused by the intermittent hydronephrosis. His advice is : first to inject and demonstrate the reproduced pain ; at another sitting, to inject strong collargol into the catheter, and *x*-ray for the position of the ureter ; to inject the kidney pelvis whilst it is in its normal bed with the patient lying down, and radiograph ; finally, to withdraw the instrument, leaving the catheter in position, stand the patient up, let a deep breath be taken, injecting 15 to 20 per cent collargol at the same time, partially to withdraw the catheter to allow of ureter movements, and then expose a plate in the standing position.

O'Donnell[26] advocates the use of a silver salt called cargentos for the *x*-ray examination of the kidneys and ureters, in preference to collargol and other salts. He says that it is entirely non-irritating, even when used in a 50 per cent solution, which gives shadows equivalent to, if not more sharply defined than, those of a metal catheter. In the bladder, a 5 or 10 per cent solution is strong enough. This solution is also of use in locating deep sinuses, and the author claims it to be superior to Beck's bismuth paste, not from the therapeutic, but from the diagnostic standpoint ; it has the special advantage of running into cavities better than the paste.

In the examination of the urinary bladder, Thurstan Holland[27] compares the results of sounding, cystoscopy, and *x*-rays ; and illustrates the paper with a large number of typical cases showing the fallacies and difficulties of each method. He concludes that radiography, from its safety, painlessness, and general reliability, ought to be the first method of examination in any case of suspected bladder calculus. At the same time the negative results are not absolutely reliable, as *x*-rays will fail to reveal the presence of pure uric acid calculi ; also they will not tell whether a stone is encysted or not ; nor will they always say whether the stone is actually in the bladder or in the extreme end of a ureter. With these reservations, however, radiography in the large majority of cases will be more reliable, and will give more information concerning the exact condition or conditions present, than either sounding or cystoscopy.

VARIOUS.—**Uterine Conditions.**—McLean and Hickey[28] used *x*-ray examination to diagnose pregnancy, when the symptoms were so vague that clinically the diagnosis lay between a large fibromyoma of the uterus and pregnancy. Side views of the pendulous abdomen, each exposure being four seconds, showed the spine, thoracic cage, legs, and arms of a well-ossified fœtus. With such short exposures there is no danger to either mother or child in making such an examination. O'Donnell[29] has made 150 exposures on such cases without any mishap to mother or child. He states that the position of the fœtus can be clearly determined from the fourth month. His exposure is less than one-fifth of a second, but he does not describe his technique on the ground that it is difficult to do so. In one case, of which illustrations are published, not only was the fœtus very plainly shown, but a diagnosis of ankylosis of the elbow was made, and this was confirmed after the birth of the child.

Lloyd and Hammond[30] relate a case of **Brain Tumour** successfully located by means of *x*-rays. The clinical diagnosis was confirmed by a remarkable radiograph (H. K. Pancoast) which showed a dark shadow, almost rectangular in shape, 4 by 2 cm., in the region of the temporal lobe. At the subsequent operation an opening was made exactly over the spot indicated by the radiograph, and the tumour, which had undergone calcareous changes, was found and removed. The authors point out that *x*-rays are not usually of value in localizing these growths, and the successful result in this

case was due to the fact that the tumour was a psammoma, and unusually large.

Müller[31] (Philadelphia) describes in full the **Sesamoid Bones,** and gives the percentages in which the different ones were found in an examination by *x*-rays of close upon 400 hands and feet. Sixteen cases of fracture of one or the other have been reported, and the author describes his own case, a woman whose foot was trodden upon whilst she was dancing; on account of continued pain a radiograph was taken, which showed a transverse fracture of the tibial sesamoid, with slight separation, but no displacement, of the fragments. The fractured bone was removed with complete relief of the symptoms.

R. Morton[32] attempts to differentiate the *x*-ray appearances in **Rheumatoid Arthritis** and **Osteo-Arthritis.** The earliest and most characteristic change which can be detected radiographically in rheumatoid arthritis is absorption of the articular cartilages—shown by a diminution of the normal bone interval between the joint ends of adjacent bones: and this is always a much earlier and more marked change than in osteo-arthritis. The second point is that erosion of the articular ends of the phalanges is more constantly present in rheumatoid arthritis. Further, there is more evidence of repair in osteo-arthritis, as shown by the formation of osteophytes, the increased density of some of the affected bones, and eburnation. On the other hand, in rheumatoid arthritis a more or less constant feature is the absorption of cancellous tissue at the ends of the bones of the affected joints.

Removal of Foreign Bodies.—Wullyamoz[33] advocates the localization and removal of foreign bodies by means of the fluorescent screen and instruments bent at a right angle. He terms the procedure "radioscopic surgery." A specially made fluoroscope is attached by means of a band to the operator's head, and he thus has both hands free; an accurately centered tube, so arranged that it is easily moved in all directions, and fitted with a diaphragm, is placed below a wooden-topped couch on which the patient lies. After the foreign body has been seen and identified, if local anæsthesia is required, cocaine is injected through a needle, bent at a right angle with its handle, which is introduced under the guidance of the screen. For incising the tissues, a similarly bent knife is used. Bent forceps are then introduced and the foreign body is seized. The operation can be finished by daylight. For the removal of such foreign bodies as a bullet in the brain, the inventor claims that the procedure is so simple, that after the skull has been opened the actual radiological operation of removal of the bullet does not take, in practised hands, more than from five to ten seconds, and is accomplished with the minimum of damage to the brain substance.

In discussing the uses of *x*-ray diagnosis in **Mastoid Disease,** Howard Pirie[34] says that a difficult case can often be made plain. It is essential that skiagraphs of both sides should be made in every case with exactly the same technique, and with the tube in exactly the same degree of

hardness. Pirie advises that a different tube should be used for each mastoid, as it is rarely possible to get one tube to remain constant in vacuum for both exposures; he finds American-made tubes best for these purposes. Chronic mastoiditis is very typical in a skiagraph: the air-cells are absent, the petrous bone stands out as a very dense roughly triangular area, with its apex pointing upwards and backwards, and its posterior border forms part of a sharp crescent-shaped line which corresponds to the upper and anterior border of the lateral sinus.

(*See also* ANEURYSM, THORACIC *and* ORAL SEPSIS.)

REFERENCES.—[1]*Pharm. Jour.* 1912, 800; [2]*Arch. Röntgen Ray*, 1911, ii, 206; [3]*Ibid.* 1912, ii, 59; [4]*Ibid.* i, 378; [5]*Wien. klin. Woch.* 1912, 67; [6]*Arch. Röntgen Ray*, 1912, i, 283; [7]*Trans. Roy. Soc. Med., Med. Sec.* 1912, 60; [8]*Bull. et Mém. Soc. de Rad. Méd. de Paris*, 1911, *No.* 26 (*Brit. Med. Jour.* 1912, i, Epit. 1); [9]*Wien. klin. Woch.* 1912, 411 (*Brit. Med. Jour.* 1912, ii, Epit. 5); [10]*Arch. Röntgen Ray*, 1912, i, 425; [11]*Lancet*, 1911, ii, 1824; [12]*Brit. Med. Jour.* 1912, i, 989; [13]*Ibid.* 1427; [14]*Ibid.* 225; [15]*Bull. et Mém. Soc. de Rad. Méd. de Paris*, 1911, Oct. (*Brit. Med. Jour.* 1911, ii, Epit. 94); [16]*Ibid.* (*Brit. Med. Jour.* 1912, i, Epit. 26); *Arch. Röntgen Ray*, 1912, ii, 120; [17]*Wien. klin. Woch.* 1911, 1326 (*Brit. Med. Jour.* 1912, i, Epit. 42); [18]*Edin. Med. Jour.* 1912, 137; [19]*Arch. Röntgen Ray*, 1912, i, 422; [20]*Ann. Surg.* 1912, i, 388; [21]*Arch. Röntgen Ray*, 1912, i, 46; [22]*Brit. Med. Jour.* 1912, ii, 774; [23]*Ibid.*, 778; [24]*Pract.* 1912, ii, 248; *Brit. Med. Jour.* 1912, ii, 484; [25]*Surg. Gync. Obst.* 1912, i, 137; [26]*Amer. Med.* 1912, i, 171; [27]*Liverp. Med.-Chir. Jour.* 1912, July, 339; [28]*Jour. Amer. Med. Assoc.* 1912, i, 751; [29]*Ibid.* 741; [30]*Amer. Jour. Med. Sci.* 1912, i, 241; [31]*Ann. Surg.* 1912, i, 101; [32]*Brit. Med. Jour.* 1912, ii, 481; [33]*Arch. Röntgen Ray*, 1912, i, 429; [34]*Ibid.* ii, 126.

NEW APPARATUS.

Though hardly new, the *Bauer Air-Regulator* for tubes has recently been so much improved that it is now reliable and workable. Loosè[1] describes the new mechanism of this valve, and also the ease and certainty with which tubes so fitted can be regulated during use to any required vacuum. The regulation is very fine, and can be done whilst the tube is in use for screening, and from a safe distance from the tube. In this paper full particulars of the work done by various makes of tubes are compared. So satisfied is the author that he says if he was forced to return to the old method of regulation he would feel as if he had suddenly gone back to the ice-age, or the tertiary period of Röntgen technique. [From a somewhat limited experience we are very favourably impressed with this regulator, especially from the point of view of screen examinations.—C. T. H.]

At the annual British Medical Association Exhibition at Liverpool, the Cavendish Electrical Co. showed an original invention by which static current can be obtained from an induction coil, working with its usual interrupter, switch-board, and so on. It was also stated that in addition, any static modality furnished by the genuine static machine, including the Morton-wave current and static-induced current, could be given in exactly the same way with this apparatus.

Muirhead Little[2] has introduced a new *x*-ray transparent material for splints, which must be of interest to *x*-ray workers. This is an

alloy of aluminium called *Duralumin*. It is non-corrodible, can be sterilized by boiling, and in addition to ordinary splints, such apparatus as Thomas' hip and knee splints, etc., can be made of it. It is very transparent to *x*-rays, and the bone image is said to be rather improved than otherwise on a series of plates exposed with duralumin splints in position on the limbs.

REFERENCES.—[1]*Arch. Röntgen Ray*, 1912, i, 469; [2]*Ibid.* 494.

X-RAY TREATMENT.

SKIN DISEASES.—Fisher[1] in discussing **Acne** relates his experience of 21 cases in which Röntgenization was followed by almost uniformly good results. All the cases were severe and had been under various kinds of treatment for long periods without material benefit. The hair, eyelashes, eyes, and moustache should be covered with lead foil during radiation of the face, the rays should be filtered, and the treatment given once or twice a week.

Hadengue and Belot[2] think *x*-rays are useful in **Sycosis**, but should be combined with other remedies. Epilatory doses are obtained in ten minutes' exposure, and in addition to epilation, pruritus and painful tension are relieved. Humid dressings and antiseptics must be carefully applied after the irradiations and before the falling out of the hairs.

Rayner's[3] paper on **Hypertrichosis** and its treatment with *x*-rays, is a valuable one, inasmuch as it is an attempt to resuscitate a treatment which at first appeared to solve a difficult problem, and then fell into desuetude on account of deplorable after-effects. The technique advocated is as follows, and we quote the author verbatim: "I use a 6- to 7-in. bulb tube with a current of from 1 to 2 milliampères from a Simon electrolytic interrupter, and a 12-in. Newton intensified coil. The anode of the tube is always 15 cm. from the skin. The pastille and the aluminium filter (0·5 mm.) are 7½ cm. from the anode and from the skin, and I do not cover the pastille by the filter. The pastille is turned in from 7 to 8 minutes by a tube of 5 or 6 Benoist penetration. The doses are given to each area at intervals of fifteen days on six successive occasions, and an interval of from one to three months should elapse after the first fall of hair before any more treatments are given." The author thinks that with perfection of technique this method of treatment will be found safe and permanent. On the other hand, Agnes Savill[4] utters a word of warning, and relates a case treated by Bordier's method, in which aluminium filters are used, where the cheeks remained perfectly normal in appearance for several months, but unfortunately telangiectasis appeared later on.

In advocating the same treatment, Stern[5] gives his experiences of 100 cases treated with *x*-rays in the past ten years. But whilst claiming success and satisfaction on the part of the patients, he admits the appearance of late telangiectasis in some cases, and a wrinkled and atrophic condition of the skin in others. He advocates the

small-and-frequent-dose method, apparently without protecting the skin, and aims at producing some mild dermatitis.

Malignant Diseases.—Hernaman-Johnson[6] inquires into the causes of failure of *x*-ray treatment in deep-seated cancer. His argument is based upon the facts that *x*-rays are destructive of embryonic cells, and that the cancer cell is a reversion to the earlier type. Absolute selection does not exist in medicine, but the action of *x*-rays on embryonic cells is as truly selective as any known to therapeutics. *X*-rays have a retarding effect on cell mitosis, and in cancer the dosage given, whilst sufficient, especially in the deeper parts, to retard only, may not be enough to kill; thus recovery, and consequently renewed growth, will take place.

Leduc[7] in discussing the Röntgen treatment of malignant tumours, says there are three distinct factors to be considered: (1) The quantity of the *x*-rays; (2) Their quality; and (3) The frequency of the application. He is opposed to the modern fashion of filtering *x*-rays, and prefers to vary the incidence on the skin, asserting that irradiation by heavily filtered rays must be wholly inefficacious, since the harder rays penetrate the tissues without being absorbed or affecting them in any way. He also advocates long intervals between the doses of *x*-rays, and attributes failures to too great frequency of the sittings; he thinks three weeks or a month should intervene between them. Finally, he considers post-operative radio-therapy most injurious, and believes that radio-therapeutic treatment should be given before rather than after surgical interference. When it is added that he also considers the surgical ablation of lymphatic glands in an early operation for cancer is much to be deprecated, it will be evident that he is diametrically opposed to the large majority of observers. Thus Skinner[8] urges the routine application of *x*-rays after *every* cancer operation, to be started immediately the operation wound is healed, and never in any case to delay later than ten days; and he is strongly opposed to pre-operative Radiation.

Nahmmacher[9] for the same purposes prefers radium, and states that not one of sixteen patients on whom a radical operation for carcinoma of the uterus, followed by radium treatment, had been performed, has had a relapse, though his observations go back over a period of eight years. R. Morton[10] writes that post-operative treatment by *x*-rays is not so general as it should be, and in addition there is a tendency to wait too long before instituting it, even until there are definite signs of recurrence. He thinks post-operative treatment should be started as soon as the patient can bear it, and should be energetic; it ought to be a routine after all operations for malignant disease.

Marschik and Zollschau[11] report three cases having strong bearing on this aspect of treatment: a lymphosarcoma of the tonsil, a round-celled carcinoma of the nose, and a malignant growth of the upper jaw. In none of the three was it possible to remove the whole growth, yet post-operative *x*-ray treatment in the first and last cases brought about

complete healing and disappearance of any sign of growth, and in the nasal case healing occurred with great shrinkage of growth. Hernaman-Johnson[12] has applied secondary *x*-radiation to the treatment of malignant growths. He injects a solution of strontium bromide or of collargol into the deep parts of the tumour, and then irradiates with the hardest *x*-ray tube possible. These primary *x*-rays are not meant to have any action on the tumour, but are to set up soft radiation from the injected substances in such a position that they will affect every cell of the neoplasm. He has not employed this method long enough or in a sufficiently large number of cases, to be able to judge of the clinical results, but the physical basis on which it rests is, in his opinion, indisputably sound. The same author[13] discusses the whole question of secondary *x*-radiations, and their uses and possibilities in medicine, from the physical and theoretical points of view.

Knox[14] recommends *x*-ray treatment before operation if for any cause this is not immediate on discovery. An experience of ten years has led him to the belief that early recurrence in slow-growing types of carcinoma is specially amenable to treatment, while large ulcerated areas will heal and inoperable cases may be rendered operable. In discussing post-operative treatment, he argues that if *x*-rays can cure actual recurrences—and it is certain that recurrent nodules will disappear under such treatment—then it is only logical to conclude that prevention of recurrence can be effected by immediate post-operative *x*-radiation.

In the treatment of **Sarcoma** by *x*-rays, Delpratt-Harris[15] reports a case in a boy four years of age, with a large round-celled sarcoma of the lower jaw. Coley's fluid and small *x*-ray doses reduced it somewhat in size, later on a " colossal " dose of *x*-rays was administered : six hours' dosage from a tube which coloured a disc in twenty minutes. This was repeated ten days later. Some inflammatory action followed, and a rise of temperature, but the tumour rapidly decreased in size. One month later, and a month later again, the same dose, equalling 18 S. disc doses, was repeated. Later on the growth recurred, and the boy died. The doses appear to have been filtered through aluminium. Although the treatment was not absolutely successful, life was certainly prolonged and the growth diminished in size. Hernaman-Johnson[16] adopted similar treatment in a case of sarcoma of the kidney ; he reports some local improvement but no real benefit. Treatment in this case was continued, with short intervals, for ten hours, the only filter used being lint, oiled silk, and a bandage. Intense brown pigmentation of the skin followed, and some desquamation, but no other reaction.

Levy-Dorn[17] reports two cases, one of lymphosarcoma of the cervical glands, treated by operation and *x*-rays. Several recurrences took place, but seven years after the first treatment the patient was quite well, and with no trace of glandular affection. The other case was one of periosteal sarcoma of the femur ; operation being refused, *x*-ray treatment was carried on for ten months. Atoxyl was also given.

Four years later the patient was quite well, but *x*-rays still showed the swelling of the femur.

Hunter,[18] before describing his own cases, quotes the results of numerous authorities, and gives the references, on the *x*-ray treatment of **Hypertrophied Prostate.** When hypertrophy occurs, we are dealing with a hyperplasia chiefly in the epithelial elements, a condition similar to that found in exophthalmic goitre, and therefore we should expect a good result from *x*-rays. If the growth is young and the hyperplasia chiefly epithelial and glandular, results will be brilliant. As the testicles are often increased in size, and as the age of the patient is such that the production of sterility does not matter, it is better to include these in the area exposed. From 5- to 10-minute exposures with a hard tube should be given at frequent intervals until a moderate dermatitis results. If there is improvement, it will be rapid, and if none appears in a reasonable time, it is useless to persevere.

In discussing the results of the *x*-ray treatment of **Exophthalmic Goitre,** Florence Storey[19] protests against these patients being subjected to operation, and is of opinion that all should have the benefit of *x*-rays. This treatment should be pushed, and not hurried; the ultimate result is almost invariably good. In 48 cases, 7 gave up too soon, 14 were completely cured, 22 derived very much benefit, 4 showed only slight improvement, and one, under unfavourable conditions, did not do well. Under treatment, which is pushed even to the point of some dermatitis, the pulse comes down to normal, the goitre in many cases, and the exophthalmos nearly always, disappear; tremor and perspiration are slow to yield, but do so eventually. The author is becoming more and more convinced, as the result of treating these cases with *x*-rays over a period of four to five years, that it is the treatment of the future. Hooton[20] reports 31 cases of the same disease treated on similar lines. Of 14 private cases, 10 were cured and 4 showed marked relief of symptoms. Of 17 hospital cases, 7 were cured, 4 markedly relieved, 4 showed little improvement, one was operated on after five *x*-ray doses, and in one case treatment has just begun.

The *x*-ray treatment of **Uterine Fibromata** is being carried out very extensively on the Continent. Bordier[21] has improved his technique, and says that it is now safe to assure the patient that there is no risk of radio-dermatitis, and that the menopause will follow three, or at most four, series of irradiations. For details the paper should be consulted.

Albers-Schönberg[22] obtains the same results with a different technique. He gives three irradiations, each of about six minutes, on three successive days, to each side and the centre of the lower abdomen, and always waits fourteen days before repeating this dose; the skin should be guarded by a thick leather filter. Haenisch[23] has treated 50 cases of **Myomata** and **Menorrhagias** of different kinds with *x*-rays. Fifteen are still under treatment, 4 cases he omits as receiving only incomplete treatment, 4 remained uncured (one turned out to be a carcinoma,

one a large sub-mucous pedunculated fibroid, one was operated on, and the fourth was a case of simple excessive hæmorrhage). Of the other 27 cases, 3 considerably improved, and 24 have remained cured for periods varying from three months to three and a quarter years. Especial stress was laid in the papers on the necessity of the operator's having a complete knowledge of Röntgen technique, not only generally, but also as to its application to deeper situations; also that in all cases so treated a gynæcologist should in the first place make a complete examination.

Blood Changes in Workers with Röntgen Rays.—Jagie, Schwarz, and Siebenrock,[24] as the result of the death of a chemist exposed for a long period to radium, examined the blood of a number of *x*-ray workers. In ten cases, all apparently in perfect health, there was a slight but definite diminution in the total number of leucocytes—the diminution was chiefly in the neutrophile polymorphonuclear leucocytes. It was a striking fact that the acidophile leucocytes were in some cases altogether absent. On the other hand, the lymphocytes were increased in absolute number. The case in which the exposure had been greatest showed the most marked changes. The authors are of opinion that the protective measures employed in Röntgen-ray laboratories are not completely effectual.

Aubertin[25] made similar investigations, and concludes that the actual condition is a diminution of the neutrophile polynuclear elements. This, he thinks, ought to be gravely taken into account, because it is especially by the polynuclears that the organism fights against infection. In a number of cases there was a slight degree of polynucleosis accompanied by eosinophilia. There appears to be no doubt that the cause is feeble doses of penetrating rays, received daily over a space of years.

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RADIUM AND ALLIED SUBSTANCES.

The address by Professor Rutherford[1] at the opening meeting of the Electro-Therapeutic Section of the British Medical Association at Liverpool, on "The chemical effects produced by the radiations from active matter," had an important bearing upon the difference of action, if any, between radium and *x*-rays. Discussing the various rays given out by radium, he reminded his audience how important it was to

bear in mind the relative penetrating power and energy of the three types of radiation. Alpha rays are completely stopped by $\frac{1}{20}$ mm. of aluminium, the beta rays are nearly stopped by 5 mm., and the gamma rays are only half absorbed in passing through 7 cm. In the case of ordinary tissue, the thickness for complete absorption is two or three times greater than in aluminium. Reference was then made to the large number of observations which have been recorded as to the chemical effects produced by the radiations from radium, and that the chemical effects due to the alpha rays are far more marked than for the beta or gamma rays. The evidence so far available indicates that the radiations exert a strong dissociating action on complex molecules, and break them down into simpler forms, though sometimes, under suitable conditions, there appears to be a reverse action.

From the point of view of the action of rays on living tissue, the photographs shown of the individual trails of single particles were most important: the gamma radium rays and the *x*-rays do not ionize themselves; the ionization they cause is due to the beta particles which they liberate from the atoms of matter traversed; gamma rays show similar effects to *x*-rays, only the beta particles liberated are much swifter and travel a much greater distance before being stopped. Professor Rutherford was persuaded that the physical and chemical properties of the gamma rays and of highly-penetrating *x*-rays were similar, and he suggested that in the treatment of deep-seated disease—such as malignant growths—the action of radium was in no sense different from the action of *x*-rays.

Radium in Malignant Disease.—Finzi[2] points out that there are three ways of using the radiations filtered through metal: (1) To prevent recurrence after operation; (2) To attempt cure; or (3) To relieve symptoms and prolong life. He thinks they should be used after every case of operation for malignant disease to prevent recurrence, the tubes being left in the wound at the time of the operation, especially in the types of growth which are most favourably influenced by the treatment. The attempt to obtain a cure, even if it failed, often led to considerable relief being established, but if no attempt was made to obtain a cure, and relief only was looked for, somewhat different methods of treatment were employed. The principle of the treatment is based on the fact that radium rays destroy the cells of a growth more easily than healthy cells. The result of the treatment is partly due to vital reaction of the healthy tissues, and in the later stages of the disease this is missing. The forms of growth most benefited are **Round-celled Sarcoma,** rapidly growing **Glandular Carcinoma, Endothelioma,** and slowly growing **Epithelioma.** He advises that consideration should be given to the question of treating extremely malignant forms of growth, where the surgeon's results are very bad, by radium, as possibly allowing greater hope of success. In all other cases only inoperable growths are treated with radium. For recurrent carcinoma of the breast, he often prefers *x*-rays on account of deep growths in the mediastinum.

He concludes that radium should be used in every operation for malignant disease as a prophylactic ; that an attempt to obtain a cure should be made in inoperable cases, especially of rapidly growing sarcomata and carcinomata and slowly growing epitheliomata, as even if a cure is not obtained, marked relief is given ; and that rapidly growing epithelioma, except in the earliest stages, should be left severely alone. In rapidly growing neoplasms which are still operable, consideration should be given to the usual surgical results, and if these are bad, radium should be tried when the type of growth is one readily influenced by the rays.

Macdonald[3] has satisfied himself that the *maximum benefit of radium* is only to be obtained by its use in relatively large amounts during prolonged periods of time. Whilst most of his work has been done in inoperable cases, he thinks that there is an important use for radium in conjunction with operation, and for the purpose of preventing recurrence.

Using tubes of pure radium bromide, containing 250 mgram [an enormous amount.—C. T. H.] for deep-seated cancers, he screens with $2\frac{1}{2}$ mm. of platinum, and leaves in position for from twenty-four to forty-eight hours. Sometimes the tubes are inserted right into a tumour and left for forty-eight hours. An interval of at least five or six weeks is allowed before repeating the dose. The results appear to be very satisfactory.

Ryerson[4] relates two cases of **Sarcoma** treated first by operation and then with radium, by Wickham (Paris). These are interesting compared with the large doses referred to above, as both were treated with only 4 mgram of radium, activity 500,000. A girl of ten years developed a round-celled sarcoma of the third left toe ; nearly three years after its first appearance, and after two local operations, it appeared in Scarpa's triangle. Two series of radium application, and the tumour rapidly disappeared. The other case was a large growth, possibly of endothelial origin, in the thigh of a boy. It was removed, but recurred ; under radium treatment, all deep-seated thickening disappeared, but the scar remained elevated.

Dominici and Chéron,[5] in a report on the treatment of **Deep-seated Cancers** by radium, on the question as to results, state that in favourable cases palliation of a desperate situation is procured, intolerable pain is relieved, and there are occasionally cures from the clinical point of view. Hard cancers of the tongue and of the inner surface of the cheek are unfavourable cases, and radium should not be used. Among the deep-seated cancers which have not recurred for more than two years after radium treatment, are quoted scirrhus of the breast, epithelioma of the breast and of the superior maxilla, and lymphadenoma of the parotid. Small quantities of radium, and the desperate nature of the cases when they present themselves for radium treatment, are two important considerations to be borne in mind when trying to estimate its real value.

Nahnmacher[6] for many years has combined operation for growth

removal with post-operative radium treatment, and claims marked success in the prevention of recurrence. Not one of sixteen patients on whom a radical operation for **Carcinoma of the Uterus,** followed by radium treatment, had been performed, has had a relapse, though the observations go back over a period of eight years. He advises after any operation for malignant disease, a prophylactic radium treatment extending over two or three weeks.

Shaw[7] has examined many cases of malignant disease undergoing both *x*-ray and radium treatment. In many instances he examined histological sections of the growths at intervals during this treatment. Observations were made on cases of carcinoma of breast, lip, skin, etc., and sarcoma of glands, abdominal wall, etc., and the histological changes found were uniform in character : " round-celled inflammatory infiltration, formation of fibrous tissue in varying amount and density, and necrosis of tumour cells." The author asks the question, Can we attribute these changes to the action of *x*-rays and radium ? And then, before answering it, writes as follows : " From long experience and the examination of microscopic sections of all kinds of tumours, I can affirm that all the above changes are seen repeatedly in tumours that have not been exposed to the action of *x*-rays or radium." His interpretation is that the changes are due to inflammatory processes on the part of the body tissues in their attempt to check and overcome the tumour cells, and he briefly summarizes : " Nature in her attempts to check and destroy the invading cells of a malignant growth, brings all her inflammatory forces into line. *X*-rays and radium act by destroying a certain number of malignant cells outright, but they act mainly as a stimulant to the healthy cells of the body to urge them on to still greater inflammatory activity."

Einhorn[8] considers that the radium treatment for **Cancer of the Digestive Tract** has a great future. With special instruments designed by himself for introducing the radium, and with special technique, he claims to have treated successfully, not from the point of view of absolute cure, but from that of marked amelioration of the symptoms, cases of cancer of the stomach, of the pylorus, and of the rectum. In this paper six cases are quoted in full, with the amount of radium used, the technique adopted, and the apparent results. In the case of an old lady of seventy years of age who refused operative treatment for carcinoma recti, 0·25 gram of radium—Curie 20,000 strength—was introduced per rectum daily for two years for one hour each time. Three years later the patient was still leading a comfortable existence, the tumours being palpable, but not bleeding. In cancer of the stomach and pylorus, the author claims that vomiting ceased, bleeding was markedly diminished, and the patient gained weight ; added to this there was decrease of pain in all the cases.

Ledoux-Lebard[9] (Paris) has injected *insoluble radium sulphate* in cases of **Inoperable Cancer,** and he strongly recommends this method for relief of pain in breast cases. In 16 cases so treated all had marked relief, and 5 were able to give up the use of morphia. For

PLATE IV.

RADIUM TREATMENT OF VOCAL CORDS

By ROBERT ABBE, M.D.

Redrawn from New York Medical Record

Fig. A.—First fibroma removed by a punch.

Fig. B.—Recurring tumour removed by operation.

Fig. C.—Condition when treated by radium.

Fig. D.—Normal condition six months after one radium treatment.

these injections the tubes of sulphate of radium of Jaborin are used, and the dose varies from 5 to 20 microgrammes; if these are not effectual, it is of no use using larger amounts.

The injection should be made with a syringe and a large needle, drop by drop in the track of the needle, as in using cocaine for operation. Relief follows at the end of a few hours and lasts up to fourteen days. The injection should not be repeated until the pain has completely returned; if no relief follows the first injection, it is useless to repeat.

Madame Faber[10] reports a case of **Lupus Vulgaris** of thirty years' standing, in which the whole of one cheek was strewn with ulcerated points, which was cured by radium treatment. Various treatments, including *x*-rays, had been previously tried without success.

In **Diseases of the Nose and Throat,** Ouston[11] has invented an instrument resembling a small laryngeal mirror of oval shape, so that the radium paste—which takes the place of the mercury of the mirror—can be applied to the sinuosities of the nasal cavities or to the epiglottis or larynx itself. He uses 1 cgram of radium bromide (500,000 activity) made into a paste and covered with varnish, whilst in order to keep the instrument clean when in use in the moist cavities, a piece of gutta-percha is folded over it. A case of **Lupus** involving the whole of both nasal cavities, the post-nasal space, the epiglottis, the larynx, etc., had in all sixty hours' treatment spread over one year, with considerable relief of symptoms and much direct benefit. For most of the time it was possible for the patient himself to hold the radium in position. The author is of opinion that in lupus of the nasal cavities and throat, radium appears to offer more hope of cure than any other remedy known, and it has the power of rapidly relieving pain in some forms of ulceration.

A case of **Papilloma of the Vocal Cords** is reported as cured by radium by Abbe.[12] One case, a woman, had had her larynx cleared out every six months for forty-seven years, of large masses of obstructive papillomata; after radium treatment the greater part of them rapidly disappeared, and during the following three years no operation was necessary. Encouraged by this, Abbe treated another similar case with complete success. A small "fibroma" was removed by operation from the vocal cord of a woman seventeen years of age; rapid recurrence took place, and this was excised; again it recurred, and this time as a papilloma extended over both cords. A tracheotomy was done, and through the wound a wire was passed through the larynx into the mouth. By this means a smooth capsule containing 100 mgram of pure radium was drawn into the larynx, suspended between the vocal cords, and held there for thirty minutes. Three months later no trace of the growth remained, and six months later the patient's singing-voice was perfectly restored (see *Plate IV*).

In another communication Abbe[13] publishes the results he obtained on plant growth by definite measured radium exposures, and concludes that: "A deterrent effect on all growth depends on time exposure, and must be a definite equation for every specimen of radium. The main

value lies in the demonstration that, on seeds as on tumours, the electrons may produce detrimental results as well as mysteriously beneficial ones, and that probably all the beautiful effects so often seen result in a measure from accidentally correct time exposure." The experiments were undertaken with a view to explain why in some cases, such as cancer of the tongue, exposure to radium " seems " to make the disease progress more fiercely. The author is inclined to ascribe an irritating and stimulating quality to the alpha and soft beta rays, and a destructive force to the deep, penetrating, hard beta and gamma ; and the importance of his experiments is the corroboration of the work of Wickham and others, that the best results are to be obtained by enveloping a heavy charge of radium in lead of from $\frac{1}{10}$ to 2 mm. in thickness.

Faber and Egger Max[14] report their results in a case of **Spinal Sclerosis** following syphilis, which they treated with radium applied to the whole length of the spine. Fifteen days after the first application the pains had lessened, and flexion of the arms and legs became possible. After a second treatment lasting ten hours, the patient's general condition improved, and after a similar third application the patient could hold objects, feed himself, and even hold himself erect for some minutes and take a few steps. The retrogression of the symptoms occurred in inverse order to their appearance.

A preliminary note from Percival Mills on the effect of radium on the healthy tissue cell was referred to in *The Annual*, 1912 ; he now publishes further work on this subject.[15] The experiments made were on mice, whose livers were exposed to a definite dose of protected radium ; the mice were killed at varying intervals, and the effect on the cells noted. The effect of irradiation at very close quarters is to produce in three hours a coagulation necrosis of the liver cells, from which a considerable degree of recovery is, however, possible. As the skin over the exposed area showed no macroscopic or microscopic changes, the more highly organized cell must be more susceptible. The secondary or late reaction, which corresponds to the action observed clinically, begins in from ten to twelve days with a slight hyperæmia. Mice killed fourteen, twenty, twenty-five, sixty, and 113 days after exposure were examined. Two months after irradiation, the liver showed evidence of an early stage of cirrhosis ; and in the 113 days' mouse the specimen was very like that of the sixty days', only the general infiltration with interstitial cells was greater, the fibrosis round the veins was increased, and more necrotic cells were present.

Substances Allied to Radium. — Czerny and Caan[16] have attempted the treatment of inoperable tumours with *Actinium*, by dissolving powdered actinium 0·5 gram in 10 grams physiological saline solution. Small doses were injected at first (0·01 gram), and these were afterwards increased by degrees up to 0·1 or 0·2 gram. A marked reaction came on in eight or ten hours, swelling, redness, and rise of temperature, but no unpleasant by-effects were produced. Many of the cases seemed to improve.

The same authors[17] have also treated 120 patients with the emanations and rays given off by *Mesothorium* and *Thorium*, which are possible substitutes for radium. They believe radium to be inferior to mesothorium in the treatment of superficial tumours, angioma, lupus, and keloid scars. Its action on malignant growths is exactly similar to that of radium: a lymphoid infiltration starts, followed by a proliferation of connective tissue. Eight cases of **Lupus** were cured, and six **Angiomas** rapidly disappeared. In **Carcinoma** and **Sarcoma,** cutaneous or subcutaneous metastases the size of a hazel nut lessened and often disappeared. But in large surface cancers, whilst there was superficial improvement, the disease often continued to spread in its deeper parts. Four out of 10 cases of œsophageal carcinoma, treated with 20 mgram of mesothorium in a silver tube in a sound, with exposures up to two hours, markedly improved.

Thorium *x*, in the form of a radio-active solution in normal saline, containing about $\frac{1}{100000}$ mgram per c.c., was injected in doses of 1 c.cm., into the growth or into the veins, or both, of 31 patients with carcinoma and 5 with sarcoma. Sufficient time has not elapsed to be sure of the ultimate results, but the tumours frequently became smaller and the subjective symptoms less marked. The authors conclude that 40 or 50 per cent of all their cases derived benefit from treatment with one or the other of these remedies.

Friedländer[18] reports his results of the local use of mesothorium. After failure of *x*-ray treatment, patches of **Psoriasis** were cured by an application of mesothorium. **Lupus Erythematosus** did well, as also did **Nævi.** In skin affections he concludes that mesothorium acts better than radium.

Thorium *x* is a remedy to be used with great care. Gudzent[19] reports the case of a woman suffering from chronic arthritis, into whom he injected a dose of thorium *x* solution, representing 900,000 maché units, nine days later another of 550,000, a third of 10,000, and finally a fourth of 3,000,000 units. For three days she remained in good general health, and left the hospital. Four days later she returned with pain in the abdomen, diarrhœa, etc. The temperature rose, glands inflamed, she vomited blood, and died seven days later.

A full account of the properties of thorium and mesothorium, chemical and physical, has been published by Rutherford,[20] who states that there is every reason to believe that preparations of mesothorium will give similar physiological effects to those observed in radium (see also p. 42).

Clark[21] has used *uranium* in the treatment of diseases of the skin and in malignant disease. In the case of a recurrent **Carcinoma** of the breast, a tumour as large as a fist, with frequent and profuse hæmoptysis, as a forlorn hope fortnightly injections of 15 gr. of the oxide of uranium suspended in sterile oil, were given. In a few months the tumour had practically disappeared, the hæmoptysis had ceased, nodules had gone, and the general condition much improved. Of three similar cases, two gave good results, whilst the third did not benefit. A recurrent carcinoma of the parotid was partially removed

by the knife, and the wound powdered with oxide of uranium ; there was no return five months later. In **Rodent Ulcer,** ionization with a 2 per cent solution of the nitrate gives good results. In **Lupus Erythematosus,** an ointment of uranium oxide (℥ij with ℥j lanolin) is useful ; and in **Psoriasis** a lotion of the nitrate of the strength of gr. 20 to water ℥j.

Radium Emanation.—Morlet[22] has investigated the physiological and therapeutical effects of radium emanations, chiefly in cases of **Gout** and **Rheumatic Pains,** and gives synopses of fourteen in which benefit ensued ; the results are always most favourable in gouty patients. The emanation is given by means of inhalation in a specially made and well-closed chamber, in which the patient breathes the emanation for two hours daily. In some cases there was local treatment with compresses, radiogenous earths, or injections of radium salt in addition. This new treatment is not a panacea, and if it is to be successful it must not be used indiscriminately, but an exact diagnosis of the case should be made beforehand.

Falta and Freund[23] have treated 192 cases by external applications of radio-active water, baths, emanation by the mouth, and emanation in a special inhaling-room. The authors use baths of 30,000 to 60,000 maché units ; in water by the mouth in doses of 1000 units, and by inhalation in doses of from 22 to 1200 units per litre. In acute arthritic rheumatism, in 8 out of 10 cases the swellings of the joints rapidly diminished, and the authors advise this treatment in all cases of acute rheumatism in the acute stage.

His[24] states that radio-active baths and waters owe their therapeutic value not to the radium itself but to the emanation constantly given off in the auto-decomposition of the metal. In the treatment of gout, it is necessary to charge the blood with this emanation, so that it will be retained as long as possible ; and the best mode of application is by inhalation. The patient is shut up in a carefully closed room, the air of which is charged with the emanation by allowing a thin stream of oxygen to bubble through a cylinder containing a strong solution of bromide of radium ; the air is freed from excess of carbon dioxide by being passed through another cylinder containing lime. After three years' experience, and observations on 100 cases of gout, the large majority have been so obviously benefited that His considers the results cannot be due to chance. Uric acid salts occur in two forms, the one more soluble than the other. The insoluble form is the one found in the blood of the gouty ; under the influence of the emanation it is converted into the soluble form. The emanation also decomposes uric acid into urea and carbonic acid. The inflammatory process which follows the injection of sodium urate into the tissues of a rabbit, is entirely changed in the presence of the emanation : the emigration of leucocytes ceases, and the foci of urates disappear, not by phagocytosis as in the case of the control rabbit, but by solution and re-absorption. The amount of uric acid excreted in the urine is increased under the influence of the emanation.

Gudzent,[25] differing from Falta and Freund quoted above, from a series of 400 cases treated during the past three years, considers that the acute forms of rheumatism are not suitable for treatment by radium emanation, etc., and suggests that the conditions suitable are simple chronic arthritis, chronic muscular rheumatism, and the forms of gout in which there have been little or no fibrosis or marked anatomical lesions. In 50 cases of gout the quantity of uric acid in the blood was estimated before, during, and after treatment, when it was found that the blood of 37 patients was free from uric acid after thirty-six or fewer sittings.

Armstrong,[26] as a result of careful and prolonged investigations, finds that under the administration of radium water there is greatly increased diuresis and excretion of uric acid; largely increased carbonic acid exhalation, from 20 to 60 per cent; lowered blood-pressure, especially in arteriosclerosis; decreased blood viscosity; improvement of gastric and duodenal digestion; marked solvent action on gouty deposits; breaking up of uric acid and its salts into carbon dioxide and ammonia; inhibition of inflammation and relief of pains in rheumatism, and increase of sexual vitality. It also has considerable influence over sympathetic nerve affections, diabetes, albuminuria, and glycosuria. He also[27] advocates the constant inhalation of strong radium emanation with oxygen to saturation of the system, in **Acute Rheumatism.** The same author[28] writes on the therapy of the radio-oxygen bath, from an experience of the administration of some 3000 baths. He gives in this paper full instructions as to the exact preparation of these baths, and claims that this addition to natural radio-active baths greatly increases their efficacy in cases of gout, rheumatism, neuritis, and arthritis. In the author's opinion the most important field for the radio-oxygen bath is that of early **Arteriosclerosis** and **Increased Arterial Tension.**

Pagan Lowe[29] points out that there are 12 volumes of helium in 10,000 of the water at one well in Bath, and that although helium is therapeutically useless, nevertheless its presence is an indication that the water is radio-active. He notes the rapid disappearance of indican from the urine. One of the diseases most successfully treated at Bath has been **Gonorrhœal Arthritis,** and the experiments of Wickham and others show that radium is destructive to the gonococcus. Cases of **Iritis** do remarkably well under mineral-water treatment. He has recently treated a long-standing atrophic scirrhus of a breast by exposing it to the gas from the springs. The ulcerated surfaces were exposed for ten minutes daily, and after twelve applications all the ulcers had healed and some of the surrounding induration had disappeared.

Weiss,[30] in discussing the balneological aspects of radium, points out that it is a mistake to assume that radium is the only important acting principle of most mineral waters, and that there must be a great difference between a complex natural mineral water and an ordinary well water artificially actuated with emanation.

Bellingham Smith[31] publishes a very detailed account of experiments

on the distribution and excretion of radium and its emanation after internal administration. After repeated experiments, it was found: that the excretion of radium, whether given by the mouth or by injection, appears to take place principally by the bowel, and to a slight degree by the urine, whilst with both methods of administration a widespread degree of radio-activity is evident throughout the body; that after the administration of emanation, however introduced, a general radio-activity of very brief duration is caused throughout the body, and that elimination occurs so rapidly that it was complete, after the administration of powerful doses, in so short a time as four hours.

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ELECTROTHERAPEUTICS.

Ionic Medication.—At the British Medical Association meeting at Liverpool, Lewis Jones,[1] opening a discussion, gave a very comprehensive account of the various conditions in which this method of treatment had been found useful. It has now been before the profession for about five years, and two ions in particular have been much used; the zinc ion, which has surgical application, and the salicylate ion, which has medical.

The author states that the *zinc* ion is successful in the treatment of simple chronic ulcer of the leg, bedsore ulcerations, rectal ulceration, mucous colitis, hæmorrhoids, anal fissure, ulceration in the mouth and nose, pyorrhœa alveolaris, sinuses, urethritis, various gynæcological conditions, sycosis, furuncle, acne, warts, corns, lupus, and rodent ulcer; the *salicylate* ion in perineuritis and neuralgia, painful affections of muscular and fibrous tissues, and arthritis. In addition, records of successful cases are published in which chlorine, iodine, and radium have been used. This paper contains references to a large number of the author's own cases, and to those of other workers.

At the same meeting Sloan[2] read a paper on the *Physics of Ionic Medication*, in which he described his experiments. He emphasized the fact that ionic medication is *not* electrolysis, as the latter deals with the migration of ions *to* the electrodes, whilst the former deals

with the migration *from* the electrodes; and further, the results in ionic medication are determined by the depth of penetration of a particular ion into the tissues and by the quantity driven in. The inference which the author has drawn from a number of experiments is that the electric penetration for a therapeutic dose varies from $\frac{1}{2}$ to 1 mm., and the actual quantity (of the copper ion) introduced electrically with a similar dose is about 1 mgram.

Sloan[3] also deals with the ionic treatment of certain **Gynæcological Conditions,** and pleads for a more conservative treatment of the female pelvic organs, as against the modern tendency towards their extinction by operative procedures. In all affections of a subacute nature he prefers to start with iodine, and when there is inflammation of the tubes, the ovaries, or the cellular tissue, with no suppuration, iodine ions give good results. If the case is one of simple cervicitis, zinc or copper is indicated, and when the endometrium is involved, zinc is often useful.

In the ionic treatment of **Skin Diseases,** Knowsley Sibley[4] bases his conclusions on the general idea that the skin is essentially an excretory organ, and he does not believe that an ointment applied on, or even rubbed into, the skin undenuded of its epidermis, can be absorbed to any extent. In ringworm or sycosis such ointments can act locally as germicides, destroying spores, etc., on the surface, but there is very little penetration into hair follicles; what penetration there is is a purely physical process and quite distinct from absorption. On the other hand, it is possible by means of electricity, to drive a drug through the skin. One very important and often overlooked point is emphasized, namely, that oils and fats are non-conductors of electricity, and therefore the area to be treated must be thoroughly cleansed with alcohol or ether. This would especially apply to the scalp, as brilliantine and various ointments are so frequently used for the hair. Amongst other diseases successfully treated are **Alopecia**, **Ringworm**, and **Keloid.**

It is not generally known that **Warts** can be treated satisfactorily by ionization. Lobligeois[5] says that when the warty condition is flat and confluent, this method offers the best means of cure. A 5 per cent solution of magnesium sulphate has an almost specific action upon the flat type of wart. Marquès[6] relates a case in which the backs of the hands had been covered with warts for four or five years. Absorbent cotton impregnated with 2 per cent solution of magnesium sulphate was wrapped round the hand, and on it a zinc positive electrode was attached, the negative electrode of large surface being placed upon the back. A current of 20 ma. was given for twenty minutes three times weekly, until sixteen applications had been made. The warts disappeared, leaving only small and almost invisible cicatrices.

The relief of **Sciatic Pain** is often most difficult, but even when caused by an organic lesion it can sometimes be relieved by ionization. Benitez[7] treated a case of sciatic pain caused by an osteo-sarcoma of the ilium, with salicylic ionization. In eight days tender points disappeared, and after forty-one applications the sciatica was quite cured.

Watson,[8] in an article on the various methods used at Harrogate in the treatment of this condition, also speaks highly of salicylic ionization in the treatment of chronic sciatica, and gives full details of the method of application, either by an electrode applied directly over the nerve, or by means of the Schnee bath. When the condition is associated with lumbar fibrositis, the administration of iodine in a 1 to 2 per cent solution of either the sodium, potassium, or lithium iodide, is more useful than salicylates. Wullyamoz[9] uses electrodes of an area of 2000 sq. cm., made of lead and lined with cotton wool 3 cm. thick, covered by a layer of Leduc's tissue soaked in 3 per cent salicylate of soda solution. The duration of the treatment is from one to one and a half hours, repeated every two or three days. The current varies from 200 to 400 ma. Of 18 cases, all but 2 were speedily relieved.

Webb[10] speaks highly of zinc ionization in the treatment of **Colitis,** The technique he adopts is as follows : The bowel is washed out with a copious enema of warm water. The abdomen is well soaped and the lather left on, and to the skin are applied four layers of gamgee tissue (6 in. by 4 in.) soaked in a solution of one tablespoonful of sodium bicarbonate in a wash-hand basin of warm water, and on this the negative pole, a sheet of tin or lead, is fixed. Then, lying on mackintosh, the patient turns over on the left side and a similar electrode is attached to the lumbar region, a towel binder keeping both in position. Both negative electrodes are joined. A rectal electrode, india-rubber over a spiral wire, with an opening at the end, is introduced into the rectum, and from a douche-can attached to this india-rubber tube (the spiral being attached to the positive wire) a warm 2 per cent zinc sulphate solution slowly runs into the bowel, while the current is turned on up to 15 or 20 ma. The flow of the solution continues during the whole course of the treatment, and is so regulated that about 2 pints flow in during 10 to 15 minutes. The bowel is then emptied, and the patient rests for an hour. This is repeated once every three to seven days, and the author reports having treated fourteen cases of colitis in this manner with only one failure.

Beaton,[11] under the title of *Ionic Surgery in Cancer of the Rectum*, advocates the destruction of the growth by means of the ions of zinc and mercury. For a growth in the anal region or lower third of the rectum, and involving the sphincter, the bi-polar method is employed. The growth is surrounded by zinc-mercury positive needles, inserted in the healthy tissue just beyond the edges, and apexing in the deepest portion of the growth, the negative electrode being placed in the centre. A direct current of about 2,000 ma. is turned on for twenty to twenty-five minutes, under a general anæsthetic, and in this time the whole tissue and a little beyond it, being impregnated with the ions of the metals, is devitalized and turned grey. If the growth is above the sphincter, the unipolar method is used. In both cases a sterile slough separates in about fourteen days, leaving a healthy wound. Of 15 cases thus treated by the author, success followed in 7, and 2 of these were known to be alive seven years afterwards.

Electrolysis.—Dubois-Harenith and Maes[12] advocate a new technique for the electrolytic treatment of **Sebaceous Cysts.** After removing all grease, two copper needles are implanted so as to compass the radius of the cyst, and to be parallel to one another and as close together as possible. The anode needle should be insulated to within 2 or 3 mm. of its extremity. For three or four minutes a current of 2 to 5 ma. is passed, then brought down to zero, and reversed for a short time. The two needle orifices are then closed with a zinc-oxide plaster after removal of the needles. From three to five days later it will be found that the needle orifices have joined, and that the cystic contents can be easily evacuated, and following this the cyst membrane is easily removed by forceps. No trace of the operation remains after a short time. The advantages claimed are painlessness, simplicity, no anæsthetic, insignificant dressings, and imperceptible scarrings.

Desiccation.—Clark[13] reports on a large number of cases treated by a new electrical effect. The apparatus used is a static machine of large output—3 to 6 ma.—with a pair of field regulators devised to give instant and perfect control of the current. The accessories are Leyden jars used in connection with a resonator. One end of the resonator is grounded. The unipolar method is employed. A discharge from a metal point against a target of tissue will cause an immediate change, apparently desiccation, in that tissue, which blanches if dry, and blackens if opened and oozing blood. The author first tried this treatment successfully on warts and moles, and then extended it to epithelioma, granulations, hæmorrhoids, acne pustules, bladder papilloma, etc. He concludes that he can produce either superficial or deep desiccation by this current; that it has sterilizing, deodorant, styptic, penetrating, and stimulating properties; and that it has no particular affinity for abnormal over normal tissue.

Thomas[14] has treated four cases of **Bladder Papilloma** by this method, and considers that the coil is as effective as the static machine for the generation of the current. In his opinion high-frequency desiccation is the best method of treating papillomata of the bladder. Both papers point out the distinction between oscillatory desiccation and fulguration. The former, by the continuous efflux of a current of low amperage from an extremely high voltage, produces a dehydration of tissue, resulting in blanching, devitalization, and drying; the latter, by interruptions or shocks, produces a combustion, resulting in blackening, charring, and cauterization of the tissue. The former is penetrating, the latter superficial in its effect.

Diathermy.—This is one of the most—if not the most—potent means of influencing the general and local circulation, and Nagelschmidt[15] advises its use in cases of **High Blood-pressure;** in the peripheral troubles described as "**Intermittent Limp,**" which are symptoms of partial occlusion of the femoral arteries; and in **Angina Pectoris.** Dosage is of great importance; too small a dose will sometimes not act at all, while sometimes it will have an effect opposite to that desired. Too strong a dose may be detrimental.

In showing three cases of **Malignant Growths of the Mouth and Pharynx** treated by diathermy, Harmer and Lewis Jones[16] showed that the operation can be completed in from three to five minutes, with little or no bleeding, and with very little pain, even after extensive burning. Sloughs separate in from five to ten days, leaving a healthy wound which heals rapidly, with an absence of the scarring and binding down of the parts which often followed surgical operations.

Galvanism.—There are not many records of the application of electricity in **Brain Lesions,** and Cæsar[17] thinks that there is a large number of persons suffering from the after-effects of a "stroke," who would derive considerable benefit from the following method of treatment, as applied to a patient who, two years after an accident, had so much difficulty in speaking that he could hardly be understood, was very nervous, unable to go about by himself or use his right arm, who saw double, and had convulsions. A galvanic current was passed through the brain and right arm, the latter being immersed in an arm-bath. The amount of current was 2 ma., but later this was increased, on two occasions up to 30 ma. This was carried out twice weekly for fifteen minutes at a time for six weeks, and in addition on each occasion the affected muscles were stimulated by the interrupted continuous current (100 interruptions per second). The result was a cure to the extent that the man resumed his previous occupation of assayer and mining surveyor, with recovery of speech and power in arm, and cessation of convulsions. The author thinks the treatment should not be started too soon in these cases ; a month or six weeks from the onset, in order to give time for recovery from shock, but sooner in the case of embolism.

The treatment of early and immature **Cataract** by the direct or galvanic current is suggested by Harris.[18] Mature cataracts are not suitable. To do good it is necessary to use from 5 to 15 ma. by means of eye-caps of special design. A slight burning sensation is experienced at about 10 ma. At first there should be daily sittings of ten to fifteen minutes, then every other day until signs of improvement are present. The cure takes from two months to a year, and depends on the condition of the cataract when treatment is begun. In the treatment of a large number of incipient cases the author had encouraging success.

Ultra-Violet Light.—This is recommended for the treatment of obstinate cases of **Alopecia** by Delpratt Harris.[19] He obtains it from iron electrodes between which sparks discharge from an oil condenser attached to a 10-in. coil actuated by 24-volt accumulator batteries giving 5 to 7 ampères in the coil primary. Each place is subjected to half-an-hour's exposure, the skin being separated from the quartz compressor by solid ice, three-quarters of an inch thick, renewed as it melts. Good reaction with peeling of the skin follows, the hyperæmia lasting a week, and a second administration is not given until this disappears ; treatments are continued until the returning hair is $\frac{1}{2}$ in. long. Of 9 cases, many of old standing in which all the usual remedies

had failed, 8 were cured, so that the treatment seems to be quite worthy of an extended trial.

Incandescent Light.—This therapeutic agent is strongly recommended by Humphris.[20] It is essential that the light, amounting to 500 candle-power, should come from one filament capable of carrying 12 ampères, and not from a cluster of small lights. The method of application is to sway the globe, surrounded by a bright polished metal hood, backwards and forwards over the affected part for from twenty minutes to half an hour, and the light must always be applied directly to the skin. The number of applications, frequency, and duration, depend on the results obtained. After discussing the physiological effects and the theory of its application, the cases in which it is useful are indicated. The pain of **Lumbago** is rapidly relieved, and for the **Relief of Pain** this form of treatment is very reliable; it is also useful in some **Skin Diseases,** such as acne, psoriasis, eczema, etc. Coltzhausen[21] also has had excellent results with similar treatment applied until an intense cutaneous hyperæmia is produced, and followed by the high-frequency efflux. His best results have been in **Sciatica.**

Static-Wave Current.—A non-operative treatment for **Prostatitis** is advocated by Benham Snow.[22] The *modus operandi* of the application is the same as in the treatment of other inflammatory conditions; the effects on the tissues are entirely mechanical, and when applied in the depression between the two lobes of the gland at the rectal site, it caused a contraction of the whole substance of both lobes. The current was so administered with regulation of the rate of discharge at the spark-gap that the periods of contraction alternated with the periods of rest at a rate, approximately, of 110 to 180 per minute. In acute cases he begins with a small spark-gap, and as the congestion goes down, increases its length. Each treatment lasts twenty minutes, and is given on alternate days. The effects of this treatment deduced from an experience of 210 cases are: relief of inflammation, impotency, vesical irritation, and mental disturbance, and cure of neurasthenia, etc. The wave current after a few weeks relieved the painful or sensitive condition, and was followed by, or associated with, the disappearance of the psychic condition. Two hundred of his 210 cases were completely relieved of the prostatic inflammation and associated symptoms, and the effects were permanent in nearly all the cases.

Faradism.—Hampson[23] brings about a **Reduction in the Frequency of the Heart-Beat** by means of rhythmical muscle-contractions electrically provoked. When intermittent contractions (under Bergonié's system) are applied to most of the large muscles at the same time, a large part of the body is converted into a pump which assists the blood-stream in its natural course, by emptying the veins towards the heart with each contraction. Observing this, the author regulates the frequency of such intermittent muscle-contractions in a definite relation to the frequency of the patient's heart, and then the artificial waves of blood-pressure set up in the venous system reinforce the heart's action at periods coincident with its own impulses. He

finds that if the electrical interruptions are made definitely slower than the heart-beats, the latter will, if the disparity of frequency be not too great, be brought into conformity, and thus the initial pulse-rate is lowered. Cases are quoted in support of this contention. It is suggested that there is a large field of usefulness for this treatment in cases of dilated, weak, and irritable hearts, such as get relief from going to Nauheim.

Another paper by the same author[24] elaborates still further the physics of this subject, and the method of application is more fully explained. Electrodes of large size are held in firm contact with the front and back of the thigh, calves, sides of the abdomen, and the back. A faradic current of moderate tension is passed through all the electrodes simultaneously; these stimulations are set at a slightly slower rate than the pulse, and when the latter synchronizes, the stimulations are again slowed, and so on until the rapid heart beats at a normal rate. It is a method to be used with caution; the heart must be watched very carefully, and the contractions must be very gentle.

Connected with this subject and treatment is the use of electricity in cases of **Obesity,** advocated by Humphris,[25] who uses a faradic current regulated by passing through a metronome, and giving 100 to 120 interruptions per minute. After this the current is distributed to the various electrodes by means of a wall-plate. Two kinds of electrodes are applied: (1) A semi-reclining chair in which two form the seat and two the back, each electrode being covered with a towel wrung out of warm water; (2) Movable electrodes, metallic, and curved to apply to the thighs, calves, abdomen, and arms. There are twelve electrodes in all, which cover a surface up to 10,000 square cm. in very fat people, and this works out at a 50 ma. current. Treatment should begin with twenty minutes, increased daily by five minutes, until forty or fifty minutes are reached. Patients begin to lose weight from the first, lethargy is lost, and the general health benefits. In very stout cases, the treatment lasts from four to six weeks, and during this time anything up to 40 lb. weight may be got rid of. It is best to aim at a reduction of from $2\frac{1}{2}$ to $3\frac{1}{2}$ lb. a week, and a total of 10 per cent at one series of treatments; weight lost slowly is more likely to be lost permanently than when got rid of quickly.

References.—[1]*Brit. Med. Jour.* 1912, ii, 486; [2]*Ibid.* 491; [3]*Lancet*, 1911, ii, 1759; [4]*Arch. Röntgen Ray*, 1912, ii, 19; [5]*Progrès Méd.* 1911, July 29 (*Arch. Röntgen Ray*, 1912, i, 454); [6]*Arch. d'Elect. Méd.* 1911, Dec. (*Brit. Med. Jour.* 1912, i, Epit. 12); [7]*Brit. Med. Jour.* 1911, ii, Epit. 57; [8]*Ibid.* 1912, i, 946; [9]*Arch. Röntgen Ray*, 1911, ii, 268; [10]*Lancet*, 1911, i, 1068; [11]*N.Y. Med. Jour.* 1912, i, 634; [12]*Presse Méd. Belg.* 1912, Mar. 24; *Arch. Röntgen Ray*, 1912, ii, 123; [13]*N.Y. Med. Jour.* 1911, i, 1131; [14]*Surg. Gyn. and Obst.* 1912, i, 315; [15]*Arch. Röntgen Ray*, 1912, i, 334; [16]*Trans. Roy. Soc. of Med. Laryng. Sec.* 1912, 143; [17]*Brit. Med. Jour.* 1912, i, 1063; [18]*Jour. Adv. Therap.* 1911, Sept. (*Arch. Röntgen Ray*, 1912, i, 369); [19]*Lancet*, 1912, ii, 25; [20]*Arch. Röntgen Ray*, 1911, ii, 176; [21]*Month. Cyclop.* 1912, May (*Arch. Röntgen Ray*, 1912, ii, 203); [22]*Brit. Med. Jour.* 1912, ii, 492; [23]*Trans. Roy. Soc. Med. Elect. Therap. Sec.* 1912, 119; [24]*Brit. Med. Jour.* 1912, ii, 494; [25]*Ibid.* 493.

Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1912, BY MANY CONTRIBUTORS.

Together with a brief Synopsis of Treatment recommended during recent years.

GENERAL REVIEW.

Anæsthetics.—The position of inhalation anæsthesia as the only practical method under which to conduct surgical operations is more than ever assailed by the clinical and experimental work of the past year. In consequence, although for routine use inhalation remains for the present our safest and most trustworthy road to anæsthesia, yet for special bodily conditions of the patient and for special circumstances we have now always to weigh the comparative claims of infusion anæsthesia, whether with ether, hedonal, or paraldehyde, of spinal analgesia, and of local or regional anæsthesia. Moreover, inhalation anæsthesia itself is modified by the combined use of various hypnotic drugs and by the recent method of tracheal insufflation. These various methods, and the pathology of post-anæsthetic poisoning, supply the subject of most of the important contributions to the recent literature of anæsthesia.—[J. B].

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Diseases of Children.—As an artificial food for infants there is an increasing tendency to use cow's milk less diluted than has been customary, and there are many who now employ whole milk modified in one way or another. Eiweiss milk, also known as casein milk or albumin milk, continues to be used with success, chiefly in Germany. It appears suitable for cases of summer diarrhœa especially. The results are said to be better since the importance of adding maltose as soon as possible, has been recognized. Lactalbumin (albulactin) is proving a valuable aid in cases of difficult feeding. The preparation originally devised by Keller in Germany, known as malt soup, has recently been introduced into America, and is highly spoken of by some. It consists of a mixture of milk, flour, and extract of malt combined in the form of an emulsion.

In the treatment of infantile diarrhœa, the usefulness of saline infusions is generally recognized. Rogers has suggested the administration of hypertonic solutions of saline as in Asiatic cholera. At present the cases so treated are too few to warrant an opinion as to its value.

More cases have been recorded in which thyroid extract has been used for the treatment of enuresis. The results have been best when the enuresis has been accompanied by signs of delayed development.

Infantilism, and its relationship to the ductless glands and visceral diseases, continue to receive attention. Dupuy recommends that retarded growth should be treated by a combination of the extracts of several glands, including those of the pituitary, suprarenal, and genital glands.

Recent work favours the view that the infection of rheumatic fever may gain admission through the nose and throat, especially through the tonsils. Consequently more importance is being attached to effective local antiseptic treatment of these situations. In the belief that tonsils and adenoids may act as local sources of infection, their removal is being advocated to diminish the severity and frequency of future attacks.

Salvarsan has had a more extended trial in the treatment of congenital syphilis, but the results have not been very encouraging.

Further investigations with tuberculin lend support to the belief that tuberculosis is exceedingly common in children. The reaction found most generally useful is that of von Pirquet. In the medical forms of tuberculosis in children, the various tuberculin preparations have a limited scope of usefulness.

The hæmorrhagic diseases of the newly-born are still imperfectly understood. According to the published results, however, the use of normal human serum has been more successful than any former method of treatment.—[F. L.]

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Dermatology.—Much attention has been directed to the conception of anaphylaxis, as explaining many chronic diseases of the skin the causation of which is still obscure. The subject is treated in the text under the heading "Dermatoses of Internal Origin."

Experiments with the use of salvarsan and other allied organic products of arsenic in diseases such as pemphigus and lichen planus, in which arsenic has long been used with success, render it probable that these organic and less toxic preparations will find an extended usefulness in such cases.

The wide diffusion of the mycotic diseases grouped under the general designation of sporotrichosis is becoming more and more established. An important communication on the subject by the French author who has made the chief advance in its investigation is fully abstracted (*vide* "Sporotrichosis") in this issue.—[E. G. L.]

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Digestive Diseases.—Little definite progress can be reported this year, though excellent accounts have been given of tuberculous and pneumococcal peritonitis, gastric hyperacidity, and visceroptosis. All these subjects are referred to in the appropriate paragraphs.—[Ed.]

GENERAL MEDICINE.—One promising line of treatment for leukæmia that has been brought forward during the past year is the use of benzol.

Rheumatoid arthritis and allied disorders have been considered at some length; and some weighty contributions to the vexed question of Graves' disease and its treatment have also been reviewed at length. —[ED.]

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GENERAL SURGERY.—There is nothing startling in the year's record of general surgery. The operative treatment of fractures remains *in statu quo*, except that surgeons are recognizing that Lane's insistence on the necessity for more careful asepsis than is adequate in abdominal surgery is a *sine qua non* in this department.

In this year's ANNUAL there is a description of Tansini's operation for cancer. The illustrations show the technique very well, but although it may be suitable for those cases where the cancer is in the middle or outer sides of the breast, it is not suitable for those situated in the two inner quadrants.

A good deal of work has been done in surgical tuberculosis, but opinions are by no means unanimous as to the advantages or otherwise of tuberculin. Stiles has done some good work on bone tuberculosis, which shows that the primary focus is in the diaphysis and not the epiphysis, and the incidence of tubercle in certain parts of the bones is dependent on the blood-supply. His paper affords strong evidence of the great need for supervision of the milk supply if the tuberculosis of childhood is to be prevented.

The open-air treatment is meeting with increased favour, and surgical opinion is much more conservative in undertaking operation in surgical tuberculosis than formerly, more reliance being placed on open-air and general treatment.

There are also good articles on the transplantation of pieces of fascia, and a simple but efficient method of lateral anastomosis of blood-vessels.—[P. L.]

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GENITO-URINARY SURGERY.—Decapsulation of the kidneys for the treatment of renal diseases has never been regarded with great favour in this country. The reviews of the literature emanating from German and French sources respectively, conclude unfavourably in regard to its therapeutic value both in renal disease and in puerperal eclampsia.

The operative exploration of both kidneys as a diagnostic measure preparatory to nephrectomy when catheterization of the uterus has failed, was introduced by Rovsing, and has been used by several surgeons with satisfactory results. Some slight variations in the technique of nephrectomy are suggested by Gorster and by Mayo.

Interesting experimental work on ureteral grafts in which blood-vessels were used, has been published by Chiasserini.

Articles on radiography in vesical stone, and on the bacteriology and treatment of cystitis, review past work without adding anything of striking interest.

Transperitoneal cystotomy finds an advocate in Parker Syms. Diverticula of the bladder are being operated upon more frequently of late years.

Recent work on the prostate includes observations on the pathology of enlarged prostate, series of cases of and observations on perineal and suprapubic prostatectomy, and discussions of the after-results of these operations, all of which are of importance and interest. Urethral calculus is the subject of some interesting observations by Monsarrat. —[J. W. T. W.]

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Gynæcology and Obstetrics.—In obstetrics, the principal feature has been the amount of attention directed to the treatment of puerperal infections. On the one hand, the results of vaccine treatment at some of the larger maternity institutions have been published, and are encouraging provided it is commenced early in the infection. On the other hand, the surgical treatment of puerperal thrombophlebitis proves more and more satisfactory.

An important paper from German sources gives details of a physico-chemical means of diagnosis of pregnancy.

Several interesting cases of attempts to cure the toxæmias of pregnancy by means of serum obtained from healthy pregnant women have been published, but further experience is required before any definite statement can be made.

An important paper has been produced on bacilluria in women, in which it is shown that a coliform organism is frequently present in the bladder of women, and is therefore saprophytic in nature and, further, that of the coliform organisms present in bacilluria, there are many biologically distinct strains. The bearing of these findings on treatment is strongly against the use of stock *B. coli* vaccines.

In gynæcology noteworthy papers have appeared on the radical treatment of carcinoma of the cervix, on operative measures to correct congenital deformities of the genital tract, and on hæmostasis in gynæcological operations.—[V. B.]

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Diseases of the Heart and Blood-Vessels.—The new cardiology continues to extend its borders, but not at the same rate as in previous years. The ground already gained is now being surveyed and mapped out more precisely. One practical result is an increasing knowledge of the action and uses of digitalis and the other cardiotonic drugs ; and another, a more perfect understanding of the means of discrimination between those types of arrhythmia which should be regarded with respect, and those which may be safely ignored.

Some new work has been done in regard to cardiac syphilis, and

especially as to the possibility of checking its course by specific treatment.

Separate articles on abdominal angina and auricular fibrillation have been found necessary; both of these important conditions are amenable to treatment, the lines of which are laid down in the paragraphs dealing with them.

As usual, there is much discussion as to the causes, diagnosis, and treatment of arterial hypertension; this also has been duly noticed.—[C. C.]

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Acute Infectious Diseases.—The dietetic treatment of typhoid fever has ever been the subject of discussion, and of late years the views of those who advocate a generous diet have been in the ascendant. Amongst them the American School has been especially prominent. Recently these views have been put upon a more accurate foundation by the classification of foods according to their caloric value. An account of the application of this system to the feeding of typhoid patients will be found in the article on that disease. It constitutes a distinct advance in the treatment of typhoid fever.

Bainbridge's Milroy Lectures on meat poisoning and paratyphoid fever should go a long way towards clearing up the confusion which has hitherto existed in respect of these diseases; while all doubt as to the nature of "Brill's disease" has been removed by the experiments of Anderson and Goldberger, a reference to which will be found in the article on typhus fever. Amongst the other subjects dealt with in connection with the acute infectious diseases the most important are, the method by which the dose of antimengacoccic serum to be given by lumbar puncture is regulated, the prophylactic vaccinations against scarlet fever, and the very severe epidemics of milk-borne tonsillitis which have occurred in some of the large cities of the United States.—[E. W. G.]

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Nervous Diseases.—Amongst the subjects specially discussed in the present volume are those of general paralysis and its treatment by the induction of artificial pyrexia. Attention is also directed to the treatment of epilepsy, which has been discussed by an important American congress. The subject of congenital torticollis and its relief by suitable exercises is also dealt with, whilst other articles deal with telegraphists' cramp, sciatica, etc.—[P. S.]

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Diseases of the Nose, Throat and Ear.—A disposition to earlier surgical attack upon the complications, intracranial and otherwise, of otitis media, is widely discernible. The problems of internal ear disease continue to provoke enquiry; while vaccines and salvarsan are both finding a definite though restricted place in the armamentarium of the aurist.

There is again much to notice in relation to sinusitis, and many writers have dealt with the subject of septal deviations and their operative correction.

In this province, however, probably the most important advance is the increasing advocacy of enucleation of diseased tonsils as against excision by the guillotine. In the paragraph which deals with tonsillar disease, many papers dealing with this subject are referred to.—[Ed.]

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Ophthalmology.—Glaucoma continues to be the subject which excites the most lively interest among ophthalmic surgeons, especially as to the choice of operation for the chronic form of the disease, a subject discussed in the present and many preceding issues of this Annual.

The importance of an accurate mapping out of the visual fields, both for white and colours, is becoming more insisted upon in optic nerve affections (more especially in connection with the diagnosis of cerebral tumour), and also in the diagnosis of chronic affections of the retina and choroid, such as retinitis pigmentosa and the various types of chronic choroidoretinitis. It must be confessed that, except for syphilitic and tubercular affections, the pathology of these latter conditions is still obscure, and that scarcely anything has yet been accomplished towards rational treatment.—[A. H. T.]

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Pulmonary Diseases.—Not much new ground has been broken in the treatment of pulmonary disease this year. As regards tuberculosis the chief feature of the year has been the steady testing of the value of treatment by tuberculin, which is gradually being placed on a sound footing, and is certainly coming into wider use. There is still much conflict of opinion, however, as to the merits of the respective preparations and their dosage.

Inman has made a contribution of lasting value as to the conditions under which *secondary infection*, so often assumed on quite insufficient grounds, occurs in pulmonary tuberculosis. A full report of his conclusions will be found in the pages of the Annual.—[J. J. P.]

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Tropical Diseases.—As usual there are material advances in this field of work. Investigations into the etiology of plague and of beriberi are bringing the prevention of these scourges within the range of practical medicine. Professor Leonard Rogers is responsible for the introduction of two highly promising innovations in treatment—the use of hypertonic saline injections in cholera, and of emetine in amœbic dysentery and its complications. Researches into the treatment of trypanosomiasis have resulted in the discovery of trypasatrol, a trypanocide of which much is expected.—[Ed.]

Urinary and Renal Diseases and Diabetes.—The work on nephritis during the past year has been largely from the experimental aspect, but some attention has been paid to prognosis and treatment. Diet is discussed by Kakowski in a careful paper, and urinary analyses are given. In the diagnosis of renal tuberculosis much attention has been given by Continental observers to the antigen reaction, but so far the method seems still on probation. The tuberculin treatment of renal tuberculosis was discussed at the German Urological Society.

Under "Glycosuria" will be found a full abstract of Garrod's Lettsomian Lectures—an important contribution to an important subject.

In the treatment of diabetes, extracts of pancreas continue to excite interest. Cammidge, in discussing diet, lays stress on the importance of the determination of the proportion of urinary sugar possibly derived from protein.—[F. D. B.]

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Venereal Diseases.—As regards syphilis, Noguchi's claim to have obtained pure cultures of the *Spirochæta pallida* has not been confirmed by Levaditi and Danulesco, who have repeated his experiments, and regard the spirochæte cultivated by Noguchi as a saprophyte differing biologically and morphologically from the *S. pallida*. Further research on this point is therefore necessary. On the other hand, evidence as regards the life history of the *S. pallida* is accumulating. Andrew Balfour and others have observed granule shedding, which probably represents spore-formation, and Ross suggests that the spirochætal form is developed from round bodies found in the large mononuclear cells of the lymphatics, analogous to "Kurloff's bodies." With regard to salvarsan, the majority of impartial observers regard it as an auxiliary drug to be used only in special cases; even its most persistent advocates consider a subsequent course of mercury advisable; a minority of enthusiasts claim that the disease can be aborted by salvarsan in the early stages. On the other hand, the evidence as to its toxic effect continues to accumulate, and has led to the production of a new preparation called neo-salvarsan, which is said to be equally efficacious and less toxic. So far these claims have not been substantiated.

In gonorrhœa, there is little to report, except that the value of gonococcal vaccines is the subject of much divergent opinion.—[C. F. M.]

ABDOMINAL CANCER. (*See* Cancer, Abdominal.)

ABDOMINAL SURGERY. *Sir B. G. A. Moynihan, M.S., F.R.C.S.*
H. Upcott, F.R.C.S.

According to Morison,[1] the principal indications for operation in the abdomen are:—

1. *Hæmorrhage.*—Intraperitoneal hæmorrhage is an emphatic indication for operation.

2. *Wounds.*—Every wound of the abdominal wall should be explored. If the peritoneum is intact it should, of course, not be opened.

3. *Some abdominal injuries*, such as a sudden, severe, localized blow. A history of such an injury affords by itself sufficient indication for operation.

4. *Prevention of Sepsis.*—This implies early operation in appendicitis, perforating ulcers of the stomach and duodenum, etc. If these cases were operated upon within twelve hours, the present deplorable mortality would be immensely lessened.

5. *Mechanical Obstruction.*—Such serious results may follow obstruction of the kidney and ureter or bile-ducts by calculi, that they should be removed while they are easily accessible. The prevention of the dangers of sepsis is also an indication for their removal. Intestinal obstruction affords a most important indication for operation, but to be effective it should be undertaken early.

6. *Removal of a Focus of Disease.*—This most important indication not only includes the removal of septic foci, but affords a reason for operating upon tuberculosis and cancer, both of which are at first local affections.

7. *Exploratory Operations.*—These should not be performed merely because there exists a doubt in the diagnosis. There must be a reasonable probability of something organically wrong which may be remedied by surgical treatment.

REFERENCE.—[1]*Lancet*, 1911, ii, 1683.

ABORTION. (*See* MISCARRIAGE.)

ACANTHOSIS NIGRICANS. *E. Graham Little, M.D., F.R.C.P.*

A case of this rare affection at an unusually early age (a girl of fourteen) is reported by C. J. White.[1] The child had deeply pigmented raised patches which histologically showed marked acanthosis, under the right breast, about each axilla, around the neck, in the groin, on the hip-bone, around the navel, on the anus, and on the labia majora.

TREATMENT.—The condition improved notably under **Thyroid Medication** (gr. 3 after each meal) and a local application consisting of **Green Soap, Oil of Cade,** and **Alcohol.**

REFERENCE.—[1]*Jour. Cut. Dis.* 1912, 179.

ACETONURIA IN CHILDREN. *Frederick Langmead, M.D., M.R.C.P.*

ETIOLOGY.—Although it has been recognized that children are liable to pass acetone in the urine from slight causes, and that its occurrence is usually unaccompanied by any special symptoms, it has been customary to arrange its causes into certain more or less defined clinical groups. As R. S. Frew[1] points out, these have been classified as follows: (1) Diseases in which *gastro-intestinal* symptoms (diarrhœa, vomiting, or constipation) are prominent; (2) Cases of so-called "*cyclical vomiting*"; (3) *Febrile* states; (4) *Toxic* conditions, including diabetic coma, post-anæsthetic and salicylic acid poisoning; (5) Conditions of *starvation* and rapid tissue waste.

Frew has examined the urines of 662 unselected children. Three specimens were tested in many instances, one of the urine passed within the first twelve hours after admission to the ward, one passed about thirty-six hours, and one about sixty hours, after admission. Rothera's test, slightly modified by Garrod, was used in every case. To 5 c.c. of urine are added 5 c.c. of a saturated solution of ammonium sulphate crystals and 2 c.c. of ammonia, and then a few drops of a freshly prepared 5 per cent solution of sodium nitroprusside. Acetone gives a slowly developing permanganate colour.

Acetone was detected in the urine in 408 (or 61·6 per cent) of the 662 cases. Acetonuria is therefore a common occurrence among hospital children. It was rarely present in the urine just after admission, not infrequently in the urine passed twelve hours later, most frequently and in greatest amount in the thirty-six-hours' specimens. In those cases in which the acetone reaction was markedly positive, aceto-acetic acid was also found. The acetonuria occurred more frequently in children over than under two years of age, and bore no relation to the disease for which the patient was admitted. It is generally agreed that lack of carbo-hydrates is responsible for the production of the acetone series (acetone, diacetic acid, β-oxybutyric acid). Frew came to the conclusion that this was to be attributed to a temporary failure of digestion caused by change of diet on admission to hospital.

This work clearly shows that the presence of acetone in the urine of children a few days after admission to hospital or change of diet, has no clinical significance. There are certain conditions, however, like cyclical vomiting and delayed anæsthetic poisoning, where acetone and diacetic acid occur in the urine in large quantities for some considerable time, and where their presence is accompanied by a strong smell of acetone in the breath, with more or less marked symptoms of acid-intoxication (as in diabetic coma). Occurring in such circumstances, acetonuria forms part of a very definite clinical picture.

Vergely[2] has studied the significance in infants of acetonuria in association with gastro-enteritis. He finds that acetone, diacetic acid, and β-oxybutyric acid are commonly present in the urine of infants and young people suffering from digestive disturbances. Their presence, he considers, is a favourable sign when no serious lesion of the kidneys, liver, lungs, or nervous system exists. When the urine contains these bodies, he advises **Abstention from Meat** and a **Carbohydrate Diet** during the acute stage.

REFERENCES.—[1]*Lancet*, 1911, ii, 1264; [2]*Rev. de Med.* 1911, 832.

ACNE VULGARIS

E. Graham Little, M.D., F.R.C.P.

TREATMENT.—Smiley[1] reports some very encouraging results with **Vaccine** in the treatment of acne vulgaris. Most patients require internal treatment in combination with the vaccine: either **Sodium Citrate** when the coagulation of the blood is rapid, or **Calcium Lactate** when it is delayed. The diet is not altered, except that any excess

of alcohol, tea, coffee, or tobacco is discouraged. When the active process has died down, daily **Massage** is recommended.

The doses of the acne vaccine are on the average 5 million as an initial quantity. In 86 per cent of the cases, *Staph. albus* was a secondary infection, and the acne vaccine was combined with a staphylococcus vaccine, the latter in initial doses of 100 million. Smiley regards the symptoms associated with acne—constipation, headache, poor circulation, anæmia, chlorosis, etc.—as due to acne bacillus toxins, and finds them relieved by the vaccine injections *pari passu* with the skin. Only autogenous vaccines were employed, and 93 per cent of the patients treated could be pronounced "cured."

Gunn[2] deprecates the use of sulphur in this affection, and prefers the following treatment. The skin, unwashed, is wiped with a soft towel and uniformly painted with 1 per cent solution of **Iodine** in rectified spirit (freshly prepared) by means of a camel-hair brush. The eyes should be kept closed to prevent lacrymation; the application is best made at night, and washed off next morning with ammoniated water. The treatment can be repeated in from four to seven days. Alkaline soaps are recommended with young people in preference to superfatted. A rubber sponge pressed over the skin empties the sebaceous ducts very successfully. The scalp should be washed with **Soap Liniment** (sapo mollis 4 oz.; spt. vini rect. 2 oz.), and then the following lotion applied:—

R Acid. Salicyl.	℥ij	Spt. Vini Rect.	ad	℥vj
Ol. Amygdal.	℥vj			

Ionization (p. 72) and **X-ray** applications (p. 59) are also recommended.

References.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1274; [2]*Pract.* 1911, ii, 715.

ACROMEGALY. (*See* Pituitary Body.)

ACTINOMYCOSIS. *Herbert French, M.D., F.R.C.P.*

Actinomycosis sometimes gets well rapidly under the use of iodide of potassium, and under those circumstances no other treatment is required. More often, however, the potassium iodide, though it relieves the disease, stops short of curing it, even when surgical measures are adopted at the same time. It is stated by R. Kinnicutt and W. J. Mixter[1] that it is possible to prepare a **Vaccine,** injection of which assists materially in the cure in some such cases. It is not possible to standardize this "vaccine" in the ordinary way, because the colonies of actinomyces differ altogether from corresponding colonies of cocci or bacteria. The authors give the mode of culture of the parasite and the mode of preparing the "vaccine;" the routine method of treatment was to give 0·1 c.c. of the resultant product subcutaneously for the first days, repeating this for three or four days, and increasing the amount given by 0·05 or 0·1 c.c. each time until a dosage of 0·75 c.c. was reached. Naturally, as with other abscesses, if there were any collections of pus, incisions were made into these,

and drainage established. The authors have treated in this way eight cases of actinomycosis, two with abdominal, two with pulmonary, and four with cervico-facial localization. The thoracic cases were all advanced when first seen, exhibiting lesions through from the lung on to the chest wall; both grew rapidly worse and died; there appeared to be an immediate large increase of the actinomycotic granules in the sputum after each injection. In the abdominal cases surgical measures were adopted at the same time, and it was difficult to judge of the effects of the "vaccine." It may be concluded apparently that in cases of actinomyces of the lung, when there is generally secondary infection as well, the "vaccines" are useless.

Quite the reverse appears to be true when the disease is local to the mouth or neck. Of the four cases of actinomycosis of the jaw and neck, three have apparently recovered completely, and one is rapidly improving under that treatment. The improvement in one of these cases was particularly striking. When admitted to hospital, he had been suffering from actinomycosis of the jaw for over six months, had been treated thoroughly with iodide of potash, and had had numerous small abscesses which had formed, opened, and been curetted, but in spite of this, the induration had extended down the neck to below the clavicle and a short distance beyond the median line to the other side. The patient was given actinomyces vaccine subcutaneously, and all other treatment omitted. A few days after the first injection, two small fluctuating areas appeared in the neck, which were opened and found to contain pus loaded with actinomyces granules, and no other micro-organisms. After this the lesion rapidly softened and diminished in size, and at the end of a month and a half all induration had disappeared. The vaccine was given every three or four days for about three months, and, at the present time, a little over a year after treatment was begun, the patient is perfectly well and shows no evidence of the disease except for two small scars, the remains of incisions made in opening abscesses.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* 1912, i, 90.

ACTINOMYCOSIS, PULMONARY. (*See* LUNGS, SURGERY OF.)

ADDISON'S DISEASE. *Herbert French, M.D., F.R.C.P.*

A case of Addison's disease, in which treatment with **Tuberculin** appeared to be directly responsible for the good result, is recorded by J. M. H. Munro,[1] but so variable is the course of this disease, that it is very difficult to be sure whether the favourable result is really due to the treatment adopted. Presumably tuberculin may assist in checking the progress of tuberculous destruction of the suprarenal capsules, but unfortunately the symptoms of Addison's disease seldom become recognizable before the degree of suprarenal disintegration is so great that even if further destruction is prevented, the internal secretion of what remains is barely sufficient to support life. Probably only a few cases will present recognizable symptoms early enough for

tuberculin to save the patient. Be this as it may, however, Munro's patient, having first come under treatment in April, 1907, was still alive and in good health in March, 1912, after receiving several courses of treatment by tuberculin; her health appeared to improve each time this was given, and to retrogress when it was omitted. Human T.R. was employed, the initial dose being $\frac{1}{1500}$ mgram, and altogether a very large number of injections were given, the dose after a time being increased to $\frac{1}{1000}$ mgram, given weekly over a period of several months; and at a later period doses of $\frac{1}{500}$ mgram were used. A large number of opsonic index determinations were made also, but they did not prove clinically useful and were ultimately omitted. On two occasions a course of suprarenal extract was tried, but each time the patient had to cease taking this on account of the nausea it produced. The patient was still alive at the time of publication, so that it may be argued that the case had not been definitely proved to be Addison's disease. Clinically, however, she was a typical case, and so far as it is possible to prove such a thing at all, it seemed quite clear that she benefited greatly from the tuberculin treatment.

The relationship between the adrenal cortex and the development of sex characters is indicated by the abnormalities which arise in children suffering from that variety of *hypernephroma* which involves the cortex of the suprarenal glands themselves. This has been known for some time, and clinically the affected children may be subdivided into two groups, namely: (1) The obese type met with in both sexes, with precocious development of pubic hair, and sometimes with precocious menstruation, but as a rule without the premature development of the sexual organs; and (2) The muscular or "infant Hercules" type, who very often show true sexual precocity. The so-called renal hypernephromata do not give rise to any similar abnormality of the sex characters. The subject has been investigated fully by Ernest E. Glynn.[2] He collected the cases recorded in the literature, and publishes twelve micro-photographs of the histological appearances of the tumours.

References.—[1]*Brit. Med. Jour.* 1912, i, 665; [2]*Quart. Jour. Med.* 1912, 157.

AIR EMBOLISM.

(*Vol.* 1912, p. 3)—The intravenous injection of 2 c.c. of Adrenalin solution 1–1000 has been suggested. The object is to stimulate the heart to powerful contractions, and thereby to expulsion of the air which has entered it.

ALKAPTONURIA. *Herbert French, M.D., F.R.C.P.*

The rarity of alkaptonuria in France is commented on by Gouget,[1] apparently only one case having been reported in that country. Seeing, however, that this condition is a peculiarity of the terminal part of proteid metabolism, its rarer incidence among some nations is not surprising.

The relationship of alkaptonuria to ochronosis has long been known; carboluria is the other well-recognized cause of this peculiar dark slatey discoloration of the conjunctiva and of the cartilages. A fresh

case of the association of carboluria with ochronosis is recorded by A. P. Beddard and C. M. Plumtre,[2] and the paper contains coloured illustrations of the lesion in the eyes, the ears, and various cartilages. Coloured plates of this unmistakable though rare affection will be found in the *Medical Annual* for 1907, pp. 393, 395.

References.—[1]*Presse Méd.* 1912, 616; [2]*Quart. Jour. of Med.* 1912. 505.

ALOPECIA.

Harris has found the **Ultra-Violet Rays** very useful (page 76).

ALOPECIA INDURATA ATROPHICA. *E. Graham Little, M.D., F.R.C.P.*

Under this name Sutton[1] describes a form of permanent baldness, diffuse in type, and associated with vascular and connective-tissue changes in the corium producing atrophy of the epidermis and the hair follicles. It resembles scleroderma and "pseudo-pelade" of Brocq, and the author places it with these as alopecias due to disease involving the nerves.

They are very intractable to treatment; the best results were obtained with long-continued and forcible **Massage,** either with a vibrator or the hand.

Reference.—[1]*Jour. Cut. Dis.* 1912, 471.

AMŒBIASIS. *Leonard Rogers, M.D., F.R.C.P.*

O. Jacob[1] reports two new cases of amœbic abscess of the brain secondary to liver abscess, and has collected nine other examples of this rare disease, in only a few of which the amœbæ were demonstrated. His two cases were diagnosed during life and operated on, but both terminated fatally. Meningitis does not usually occur, and lumbar puncture gives a negative result. The pus is very thick, like that of liver abscesses, and is not limited by a definite membranous wall. The clinical signs are less marked than in other forms of cerebral abscess, and fever is very slight. Operation gives the only chance of cure.

D. G. Marshall[2] reports a case of amœbic dysentery in a patient who had never been out of Scotland. The source of infection was not cleared up; a soldier, recently returned from a station in India where dysentery was prevalent, lived close to the patient, but he had not suffered from dysentery while in India. The climatic conditions in Great Britain are not favourable to the spread of this disease.

Treatment.—W. E. Musgrave[3] deals fully with this important subject, having had a great experience of the disease in the Philippine Islands. Amœbic ulcers are frequently found in the large bowel post mortem when the disease has not been suspected during life, and sigmoidoscopical examinations are of great diagnostic importance. He now thinks that amœbic colitis may be present without actual ulceration. In the majority of chronic cases of "clinical dysentery," **Ipecacuanha** in large doses is a very valuable drug, but in some it does no good, while it may aggravate the symptoms. An acute intercurrent

bacillary dysentery may be followed by subsidence of a previous chronic amœbic one. The two forms may be present together.

In the majority of cases of amœbiasis some form of **Bowel Irrigation** gives the best results. It is now proved that the whole of the large intestine can be irrigated per rectum, and appendicostomy is unnecessary for this purpose. An ordinary large-sized rubber catheter is used, with the patient in the left lateral, or better in the knee-elbow position. Two to three, or even four, litres (about $3\frac{1}{2}$ to 7 pints) are usually necessary. Brandy may be given as a sedative before the injection, or 4 dr. of magnesium sulphate four to six hours earlier, the last thing at night being a suitable time; one enema is usually sufficient. A 1–2000 solution of **Thymol** is the best anti-amœbic agent, and may be got into solution by the following prescription: thymol 25 grams, alcohol and glycerin each 250 c.c., 10 c.c. to be added to each litre of water used in the enema. **Bisulphate of Quinine,** of a strength of 1–500 to 1–1000, is also good, while **Nitrate of Silver,** 0·1 to 1 per cent in distilled water, is frequently of decided benefit. In old chronic diarrhœa cases he has recently had good results with **Protoiodide of Mercury** continued for two or three months with occasional intermissions. In Manilla, appendicostomy has not been much used, and the results do not warrant its continuance. Although the irrigation treatment requires several months to cure the patients, the prognosis is good with proper care.

In the discussion on this paper, W. v. Brem said, that when working in Panama he had treated amœbic infections for four years by the irrigation methods described by Musgrave, but with unsatisfactory results. During the last two years he had followed Dock in using large doses of **Ipecacuanha,** and had cured twenty-one out of twenty-two cases, the patients being proved by microscopical examinations of their stools over several months to be free from amœbæ. In one case of over two years' duration, swarming with amœbæ, gr. 120 of ipecacuanha in twenty-four hours produced a cure which has lasted for over a year. In another case, after failure of ipecacuanha by the mouth, a cure was effected by giving it per rectum suspended in starch water, ulcers in the rectum being seen to heal gradually under this treatment.

Dudley Roberts[4] deals with six cases treated at Brooklyn with ipecacuanha, in three of which amœbæ were found and ulceration was seen with the sigmoidoscope. In spite of the long duration of the disease it was rapidly cured, while in three cases without ulceration but with diffuse general inflammation of the mucosa, no benefit was derived from the treatment.

W. E. Deeks and F. W. Shaw[5] give a good brief description of amœbic dysentery, and advocate its treatment by a **Milk Diet, Irrigation** of the large bowel with saline solutions, and heroic doses of **Bismuth Subnitrate.** They give gr. 180 suspended in a tumbler of water every three hours night and day, and claim that it is a very effective method. They acknowledge that the drug has no direct action on

the amœbæ, but hold that it destroys certain bacteria, which they believe are necessary in symbiosis with the protozoal parasite to enable the latter to have any pathogenic action. They have never tried ipecacuanha, because that method did not appeal to "their physiological common sense." The amœbæ disappear under the bismuth treatment. They deal with the cases reported by others to have relapsed after their treatment, and maintain that it was not fully carried out in those cases.

Walter v. Brem and A. H. Zeiler,[6] also working in Panama, discuss the various lines of treatment used there for amœbic dysentery during the last few years, including quinine, enemas, quinine and thymol and simple saline irrigations, rest and diet alone, and appendicostomy, and show that all of them are unsatisfactory and commonly fail to eradicate the amœbæ completely from the large bowel, so that the disease often relapses or its serious hepatic complications occur later. They discuss Deeks and Shaw's bismuth treatment, and show that it has not been proved to destroy the infection permanently. Lastly, they deal with the **Ipecacuanha** treatment, and show that by means of about gr. 30 a day in salol-coated pills, the infection can nearly always be completely eradicated and permanent cures obtained, such as do not result from any other form of treatment. This very favourable result has been obtained in twenty out of twenty-one cases, the amœbæ having been proved to be absent two to four or more weeks after the treatment was begun. In one obstinate case appendicostomy was performed, and ipecacuanha introduced into the large bowel through the opening with success, while in another with rectal ulceration the drug was given by irrigation, and the ulcers were seen to heal. The steadily increasing favour which the ipecacuanha treatment is gaining among American workers is very noteworthy.

L. Rogers[7] has found that soluble salts of **Emetine** can be safely injected subcutaneously without the production of sickness or nausea, which is such a serious drawback to large doses of ipecacuanha by the mouth, and he has obtained remarkably rapid cures of both acute and chronic amœbic dysentery and of amœbic hepatitis. He also records several cases of amœbic abscess of the liver cured by aspiration and injection of emetine hydrochloride, both into the abscess cavity and subcutaneously, without drainage. He believes that all the amœbæ in the body can be killed in a very few days by about gr. 1 of emetine hydrochloride each day, in two ½-gr. doses. If these results are confirmed by others, it will constitute an important advance in tropical medicine.

There is a reference to the use of **Uzara** in this disease at page 45.

Pathology.—R. T. Wells[8] has obtained cultures of two types of amœbæ from the air by exposing suitable culture media in open Petri dishes for long periods, and thinks they may gain access to stools, pus, etc., and may prove a source of fallacy in making cultures from such material. The same writer[9] records the results of a year's special investigation of dysentery in the Hazariabagh jail, which is

situated on a plateau at an elevation of about 2000 feet. The disease was mainly of a chronic nature, most prevalent during the rainy season. He succeeded in isolating dysentery bacilli from only a small proportion of the cases, and these were mainly of the Flexner group. He found motile amœbæ in 19·5 per cent of the cases, but as they were present intermittently, repeated examinations are necessary to detect them. They differ from the amœbæ he cultivated from the air, tap water, and sometimes from fæces, which are contaminations, while the pathogenic organism rapidly dies after discharge from the body. Other cases were due to tuberculosis, but there remains a large proportion of dysentery cases in which no definite causal factor could be recognized. A marked leucocytosis was often present.

E. L. Walker[10] has made a comparative study of the amœbæ in the Manilla water-supply and in the intestinal tract of healthy persons as well as of those with amœbic dysentery. He concludes that the pathogenic amœbæ are not cultivatable, so that when cultures are obtained from the intestines they are probably derived from cysts of amœbæ which have been ingested with food and water, and passed unchanged through the intestines; these belong to the genus *Amœba*, while the pathogenic ones belong to the *Entamœba*, of which there is one non-pathogenic species, the *E. coli*, which can be distinguished by its microscopical appearances from the pathogenic ones. As the pathogenic organisms cannot live outside the human body, infection must be from previous cases of dysentery, in which the organism may remain for indefinite periods after the attack is over, and these constitute the carriers of the disease.

Chamberlain, P. Weston, and E. B. A. Vedder[11] have shown by experiment that both motile and encysted amœbæ in a water-supply can be destroyed in a short time by exposure to ultra-violet rays.

References.—[1]*Rev. de Chir.* 1911, 548; [2]*Edin. Med. Jour.* 1912, 229; [3]*Jour. Amer. Med. Assoc.* 1912, 13; [4]*N.Y. Med. Jour.* 1911, ii, 1231; [5]*New Orleans Med. and Surg. Jour.* 1911, July; [6]*Ibid.*; [7]*Brit. Med. Jour.* 1912, June 22, Aug. 24; [8]*Parasitology*, 1911, iv, 204; [9]*Sci. Memoirs India*, 1912, No. 52; [10]*Phil. Jour. Sci. B.* 1911, vi, 259; [11]*Ibid.* 383.

ANÆMIA, PERNICIOUS, *Herbert French, M.D., F.R.C.P.*

The relationship between *gastro-intestinal disturbances and pernicious anæmia* has long received attention from many observers, but whereas originally it was thought that the atrophy of the gastric and intestinal mucous membrane found in fatal cases of this malady was possibly the cause of the disease, it is now more generally held that the gastro-intestinal symptoms and the associated changes in the mucous membrane, and the anæmia itself, are due to some common underlying cause. It does not often happen, however, that such gross changes are found in the alimentary canal as those described by O. Schweeger.[1] He records two cases, one a man sixty-four years of age, the other, also a man, of forty-nine, in which from the blood picture there seems no doubt as to the diagnosis of pernicious anæmia, and in each case there were numerous ulcers in

the lower part of the ileum not unlike those seen in typhoid fever. The Widal reaction was entirely negative. The author unfortunately does not say whether the liver gave the Prussian blue reaction which is so characteristic of pernicious anæmia; nor whether the patient's serum was tested, not only to the typhoid bacillus, but also to the various paratyphoid bacilli; so that there is still an element of doubt as to the ulceration of the intestine being a direct consequence of the pernicious anæmia. Nevertheless the blood counts were as follows: in the first case the red corpuscles numbered 1,000,000 per c.mm.; the hæmoglobin was 30 per cent of normal by Sahli's method, and the leucocytes numbered 5,200. The differential leucocyte count showed 46 per cent of neutrophile cells, 0 per cent of eosinophile cells, 2 per cent of mononuclear leucocytes, and 52 per cent of lymphocytes; besides which, films exhibited a marked degree of poikilocytosis and micro- and macrocytosis. There were no nucleated red cells. In the second case, the red cells numbered 2,600,000 per c.mm., the hæmoglobin was 55 per cent of normal by Sahli's method, the leucocytes 4,650 per c.mm., 66 per cent of them being neutrophiles, 1 per cent eosinophiles, 1 per cent mononuclear leucocytes, and 32 per cent lymphocytes.

A recent summary of the gastro-intestinal disturbances observed in 58 cases of pernicious anæmia is published by J. Friedenwald.[2] His findings are in close agreement with those of previous authors. Loss of appetite was observed in 38 cases, nausea in 27, vomiting in 19, indigestion in 33, diarrhœa in 20, constipation in 27, and irregularity of the bowels in 11. The liver was enlarged in 18 instances, while in 40 it was not. Enteroptosis was present in 21 instances, and atony of the stomach in 29. Gastric catarrh was present in 9 cases. The gastric contents were examined in 43 of the 58 cases. In 30 of these there was absence of gastric digestion (achylia gastrica). In 9 the gastric digestion was diminished, and in 4 it was normal. In the 30 cases with absence of gastric secretion the total acidity ranged between 8 and 14. In the 9 with diminished gastric secretion the total acidity ranged between 22 and 46, the free hydrochloric acid being between 0·02 per cent and 0·06 per cent. In the 4 with normal digestion the total acidity ranged between 32 and 65, the free hydrochloric acid between 0·11 per cent and 0·16 per cent. The gastric secretion was examined in five patients presenting an absence of free hydrochloric acid during the period of improvement in the state of the blood as well as of the general health; in none did the secretion return during the stage of apparent recovery. From a study of the 58 patients, it is evident that a large proportion of these cases are attended with gastro-intestinal disturbances as well as with an absence of gastric secretion; there is present an achylia gastrica in about 70 per cent. In a smaller proportion of cases—20 per cent—there is a marked diminution of the secretion, and in about 10 per cent it remains normal.

Treatment.—The value of **Salvarsan** is exemplified by a number of

cases reported by Byrom Bramwell.[3] The dose was generally 0·3 gram, two, three, or more successive doses being given at intervals which varied in the different cases. The intramuscular method was employed. There were cases in which the treatment was without beneficial effect, but a remarkable feature in several instances was the fact that though the patient might be discharged from the hospital without having received obvious benefit during the stay there, the improvement resulting from the salvarsan treatment seemed to be continued for a long time afterwards, and patients who were discharged in an apparently hopeless state were found to be alive and at work months later. The following table shows how long the beneficial after-effects of salvarsan injections may continue, for whereas the last dose of salvarsan was given in February, 1911, the red corpuscles and the hæmoglobin improved progressively for months after, and were above the normal more than a year later:—

Date	Treatment	Red Corpuscles	Hæmoglobin per cent	Colour Index
Nov. 15, 1910 ..	Arsenic begun, 2 m., t.i.d.	990,000	30	1·6
Dec. 16, 1910 ..	Arsenic stopped, 9 m., t.i.d.	1,460,000	45	1·5
Dec. 24, 1910 ..	"606," 0·3 gram	1,760,000	52	1·48
Jan. 7, 1911 ..	"606," 0·3 gram	2,450,000	68	1·38
Jan. 24, 1911 ..	"606," 0·3 gram	3,125,000	74	1·19
Feb. 9, 1911 ..	"606," 0·3 gram	3,350,000	78	1·16
Feb. 18, 1911 ..	—	4,140,000	88	1·07
Feb. 21, 1911 ..	—	4,020,000	88	1·1
Mar. 11, 1911 ..	—	4,420,000	94	1·1
June 2, 1911 ..	—	4,420,000	90	1·0
Oct. 13, 1911 ..	—	4,800,000	96	1·0
Mar. 7, 1912 ..	—	6,210,000	120	0·97

It would be surprising if the correct dosage of salvarsan in these cases were hit upon in the first instance, and more work is required in order to settle the best dose, the best interval for the repetition of the dose, and the best method of administration. Meanwhile, the results recorded point to the salvarsan treatment of pernicious anæmia being better than that by arsenic given by the mouth, and it is noteworthy that Byrom Bramwell, who was the originator of the liquor arsenicalis treatment, has also been first to show the greater value of the arsenic given in the form of salvarsan in these cases.

P. Esch[4] records a case of special interest in two respects: first, that it arose during the puerperium; and secondly, that it was greatly benefited by a treatment which has not been used extensively in Great

Britain, namely, the intramuscular injection of **Defibrinated Human Blood.** The patient passed through an ordinary pregnancy in a normal way, but during the puerperium became progressively weaker and more anæmic, until ultimately the red corpuscles had fallen to 488,000 per c.mm., the hæmoglobin to 22 per cent of normal, and the white corpuscles to 2,700. Blood films showed an extreme degree of poikilocytosis, polychromatophilia, and an abundance of both megaloblasts and gigantoblasts. No other diagnosis than pernicious anæmia seemed possible, and the patient was extremely ill. The author, having previously found much benefit from the treatment of several cases of secondary anæmias after hæmorrhage by intramuscular injections of defibrinated human blood, decided to adopt this treatment here also. On June 27th, twelve weeks after the birth of the child, 35 c.c. of defibrinated blood were injected, the hæmoglobin then measuring 22 per cent of normal. On June 30th 39 c.c. were injected in a similar way, the hæmoglobin then measuring 24 per cent. On July 4th 60 c.c., the hæmoglobin measuring 35 per cent of normal; on July 11th 25 c.c., hæmoglobin 45 per cent of normal; on July 18th 70 c.c., hæmoglobin 53 per cent of normal. This was the last injection, but the hæmoglobin rose steadily afterwards, amounting on July 25th to 64 per cent and on August 25th to 75 per cent of normal. The blood picture did not change much during the first few days after the treatment was begun, but on the seventh day after the first injection, that is to say the fourth after the second injection, the original 22 per cent of hæmoglobin and 488,000 of red corpuscles had risen to 35 per cent and 760,000 respectively. There was still marked poikilocytosis, and numerous red cells were present in films. From this time onwards the nucleated red cells and the poikilocytes steadily diminished until, two months after the treatment was begun, the blood films showed no very obvious abnormality. Even more striking than the improvement in the blood was the influence on the patient's general condition. The shortness of breath, the feeling of profound illness, and the vomiting, which had been very troublesome hitherto, ceased soon after the first injection. No ill effects were observed. This treatment seems worthy of extended trial. (*See* also *pages* 39, 40).

REFERENCES.—[1]*Wien. klin. Woch.* 1912, i, 567; [2]*Bost. Med. and Surg. Jour.* 1912, 160; [3]*Brit. Med. Jour.* 1912, i, 1413; [4]*Deut. med. Woch.* 1911, 1943.

ANÆMIA, SECONDARY.

Prothæmin has proved useful in treatment (*page* 34).

ANÆSTHETICS. *Joseph Blumfeld, M.D.*

Many papers have appeared during the last two years dealing collectively with all the commonly used anæsthetics, in either their physiological or their clinical aspect. A few words may be said first upon such advances as have been made on the physiological side of the subject.

PHYSIOLOGY.

A recently described[1] series of experiments opens up once more the question of what happens to chloroform after it is taken into the blood from the alveolar air. Nicloux and Fourquier arrive at the conclusion that it is decomposed, that it is in fact hydrolysed by the alkalies of the blood, according to a chemical change thus represented :—

$$CHCl_3 + 3KOH = 3KCl + CO + 2H_2O.$$

They find in this conclusion an explanation also for " delayed chloroform poisoning," which should be regarded as due to the diminished alkalinity of the blood, not to the action of poisonous products formed by imperfect metabolism. The authors declare that whereas hitherto physiologists have studied the organism only and the changes induced in it by anæsthetics, they are now studying the anæsthetic agent itself, and discovering what becomes of it in the body.

They claim to have demonstrated that the tissues, such as those of the brain and liver, which are rich in lipoids, fix more chloroform than others, and that the cardiac muscle has greater aptitude for fixing it than has other muscle. The lungs are the chief seat of elimination of chloroform, but it can be found in the expired air as long as thirty-six hours after administration has stopped. It decreases rapidly, both from the blood and the tissues, during the first half-hour after administration has stopped, but the rate of elimination differs in different tissues, and chloroform can be extracted from fat even eighteen hours afterwards.

In the blood the globules carry seven to eight times as much as the plasma, a finding similar to that of Buckmaster and Gardner in this country. Nicloux states that the quantity of chloroform taken up by the blood is conditioned by the respiratory activity ; the more rapid the respiration, the larger the dose of chloroform absorbed. It is the proportion of the vapour in the alveolar air which regulates the passage of chloroform from that air to the blood, and vice versa.

The effect of repeated doses of chloroform has again been investigated.[2] The conclusion arrived at is, that frequently repeated small doses lead to more damage than a single heavy dose. The animals were dosed by inhalation, by the stomach, and by injection. Chloroform is less rapidly eliminated when the two latter methods are employed.

A. G. Levy[3] has experimented upon the action of chloroform when intercurrent asphyxia is present, and his conclusions support the acapnia theory, viz., they tend to depreciate the danger of increased CO_2 during chloroform anæsthesia.

PRACTICAL APPLICATION.

Hypnosis.—The use of suggestion as a substitute for anæsthesia by drugs has been freely tested by Gulliver,[4] of New York, who describes 80 per cent of successes, and thinks that the method is admirable for

the performance of short operations, such as removal of tonsils and adenoids, in an out-patient department.

Electric Sleep.—Robinovitch[5] has performed many operations on animals, and a toe amputation upon the human subject, with the aid of anæsthesia produced by electric currents. The apparatus required is complicated, and he attributes failures to faulty technique and irregular current. A direct current interrupted six to eight thousand times a minute is the desired agent. He has used this also successfully for resuscitation purposes.

Local and Regional Analgesia.—Injections of **Quinine** and **Urea Hydrochloride,** in solutions of $\frac{1}{2}$ to 1 per cent, are recommended for local analgesia,[6] and are declared to be at once non-toxic and hæmostatic. From 2 to 15 c.c. are used, and an interval of ten to twenty minutes is to be allowed after injection for analgesia to develop. It persists for a considerable period, sometimes as long as two weeks. When used for excision of tonsils, the solution should be injected into the tonsil in amounts of from 45 to 60 min.

A novel method of procuring regional analgesia is described by Dr. Max Kappis,[7] who injects the analgesic into the intervertebral foramina. This method appears too difficult of achievement, and in some regions too dangerous, to be likely to meet with wide acceptance.

Spinal Analgesia.—This method has established itself firmly as the best in circumstances which render inhalation anæsthesia undesirable. Such circumstances are the absence of a skilled anæsthetist, acute and advanced disease of the lungs, or grave abdominal sepsis in children. As a routine measure the proceeding is not to be compared with inhalation anæsthesia in properly skilled hands. For military surgery, spinal analgesia is of immense service. Those surgeons who frequently practise the method continue to give highly satisfactory accounts of their results.[8] Almost unanimously, however, they deprecate its use for operations above the level of the umbilicus, Jonnesco's practice not having stood the test of repeated trials. According to this surgeon, the addition of strychnine to the analgesic solution allowed of its being injected with safety into even the cervical regions of the spinal canal.

Sequelæ.—Vomiting after spinal analgesia is infrequent and very rarely severe. Pyrexia is common, and McGavin describes it as reaching a maximum on the night of operation, and subsiding to normal on the third or fourth day. In one or two cases it was prolonged to a week or ten days. It was present in 65·4 per cent of 500 cases. As to the cause of this pyrexia, four theories are advanced, ascribing it respectively to absorption of stovaine, absorption of blood from the puncture wound, sepsis, or disturbance of the intrathecal pressure. Headache continues to be a not infrequent sequela, and is much influenced by movement of the patient as well as by his position during and just after the injection, the lateral being inferior to the sitting posture in this respect. McGavin notices the effect of spinal analgesia in relaxing the spasms of urethral strictures. He notes four cases of

lobar pneumonia and one of bronchitis. He records 3·2 per cent of fatalities, but attributes none of them to the effects of the spinal analgesia. One of the three fatalities described by Barker is interesting in that it was just of that kind supposed to be peculiarly likely to happen with a general anæsthetic, being due to inhalation of vomited matter during an operation for intestinal obstruction. Barker deprecates the use of adrenal compounds with the analgesic, and doubts if the effects of spinal analgesia are at all prolonged by such use.

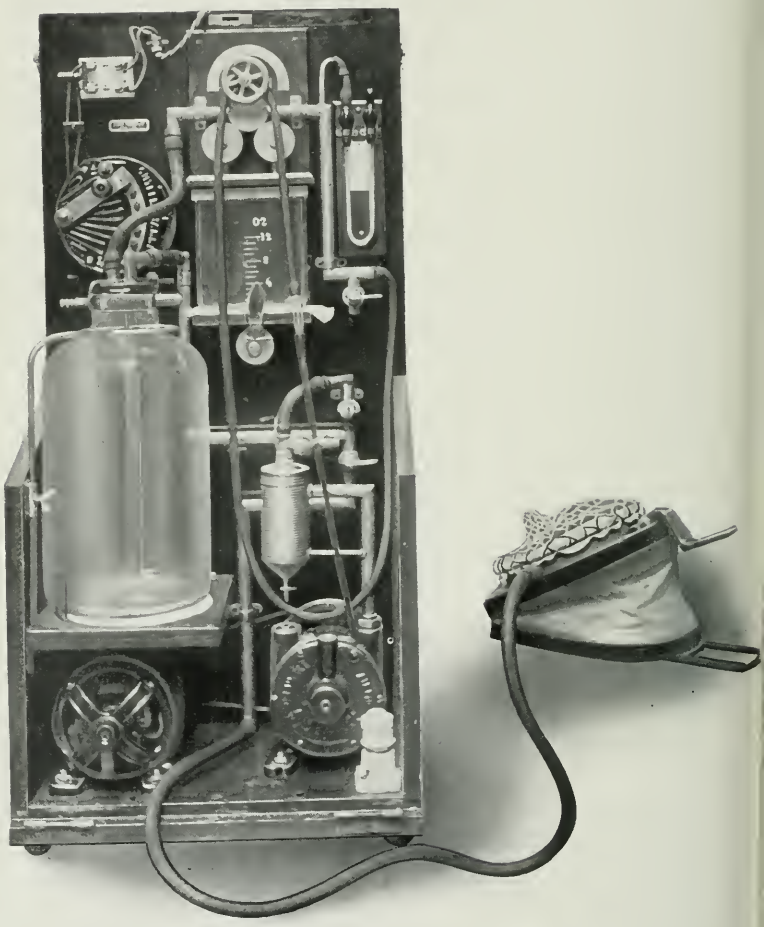
The value of spinal analgesia in mitigating or *abolishing surgical shock* may now be regarded as beyond question, and spinal injections may be advantageously employed simply for this purpose in conjunction with the use of a general anæsthetic.[9] In connection with this question Tyrrell Gray and Parsons publish some valuable work.[10] They have particularly investigated the question of blood-pressure and its relationship to shock. They find that in lumbar puncture, the puncture of the skin is accompanied by a rise in blood-pressure which varies in extent with the degree of consciousness, the pain, and the disturbance produced by the operation. Puncture of the dura causes a much larger rise, due to a definite effect on the vaso-motor centre. Withdrawal of cerebrospinal fluid tends to lower the pressure. Vomiting during spinal analgesia is due to thoracic paralysis, which induces either anæmia of the medulla, or excessive action of the diaphragm, which interferes with the stomach.

Inhalation Anæsthesia.—The use of **Nitrous Oxide** and **Oxygen** in surgery has recently been much extended, and in America particularly it is employed largely during the performance of major operations, even when these extend over long periods of time. It is obvious, however, that when used in this way the surgeon must be content with a condition which falls short, so far as perfect immobility and relaxation are concerned, of that which is habitually looked for in this country at the hands of an expert anæsthetist. From the patient's point of view, however, there is doubtless much to be said for the substitution of these non-toxic gases for the vapours of ether or of chloroform. G. M. Prince[11] declares that the method of nitrous oxide and oxygen is applicable to every kind of patient for any kind of operation. He records 2,000 cases. He gives morphine and atropine beforehand as a routine measure, and adds scopolamine in the case of alcoholics. He recommends Cunningham's apparatus, and gives CO_2 sometimes in addition to the other gases. That the method when applied to major surgery is not without fatalities is pointed out by Freeman Allen, who alludes to four deaths in New York in one year. He very justly contends that the absolute safety claimed for nitrous oxide and oxygen is based on the consideration of cases which hitherto have been almost entirely dental, or of an equally innocent nature.

A variation of this prolonged use of nitrous oxide and oxygen, whereby small amounts of ether are admitted from time to time, is also much in favour at the present time in the United States; a similar proceeding is described by Flemming, of Bristol.[12] Gatch[13] discusses

PLATE V.

ANÆSTHETICS



The Elsberg Apparatus for Intratracheal Insufflation

the advisability of employing re-breathing with the administration of gas and oxygen, and describes apparatus designed to permit re-breathing during the use of any anæsthetic.[14] He assigns the ill effects attributed to re-breathing with ether anæsthesia to anoxæmia and to over-concentration of ether vapour. The former he guards against by proper use of oxygen with the anæsthetics, and the latter by a spring-drop system of adding the ether to the inspired or re-breathed mixture of gases.

Open Ether.— Gatch believes about 7 per cent of ether to be the maximum strength of vapour permissible. This is of course far lower than the strength used with ordinary open-ether methods, when the percentage is often about 16. Hewitt and Symes[15] have performed some valuable experiments on this point, and find the percentage of ether inhaled during anæsthesia to be between 6 and 16 per cent. They find that if gauze is used upon the mask a higher percentage is yielded than from flannel or lint, the percentage rising roughly according to the number of layers of gauze. With flannel or with lint so adjusted that all inspirations and expirations pass through the fabric, a more or less equable atmosphere, containing about 8 or 9 per cent of ether vapour, may be depended upon. Gatch, in the article referred to, also claims that by finishing the administration by very complete ventilation of the lungs with nitrous oxide and oxygen, he so hastens the elimination of such ether as has been used that after-effects are conspicuously absent. Bellamy Gardner[16] concisely sums up the advantages claimed for administration of ether by the open method, and describes exactly his own procedure in the matter, which involves routine use of a small tongue clip. There can be no doubt that (as Hewitt also has pointed out) free breathing through the mouth is in most cases essential to success when this method is employed ; and if such breathing cannot be ensured evenly by a prop and arrangement of the lower jaw, Gardner's clip should be used.

Intratracheal Insufflation.—The method of administering ether vapour through a tube passed into the trachea has found much favour recently. Its especial use of course is in operations upon the thorax, when a positive pressure of vapour may be kept up and the breathing, so to speak, done for the patient. For with this method the ordinary respiration is replaced by an artificial inspiration initiated by the pumping in of ether vapour, expirations taking place around the tube. Owing to the very complete aeration produced, the anæsthetic is quickly eliminated, and after-effects are rendered unlikely. The tracheal tube is introduced under full anæsthesia, first obtained in the ordinary way. Whatever apparatus is employed, it must allow of the warming and moistening of the ether-laden air before it reaches the bifurcation of the trachea. Also there must be a safeguard against excessive intrapulmonary pressure, otherwise emphysema and defective filling of the right side of the heart may be induced. The technique of the method is well described by Elsberg,[17] whose apparatus is in favour with those trying the method in Great Britain (*Plate. V.*).

Elsberg recommends that the tube be introduced into the trachea with the aid of the direct laryngoscope, the head hanging down over the end of the table. C. H. Peck speaks well of the method in cases of operations about the face and tongue. (*See* also LUNGS, SURGERY OF.)

Ethyl Chloride.—The open administration of ethyl chloride is described and recommended in a pamphlet by R. W. Hornabrook, of Melbourne, who has devised a simple means of rendering kelene tubes capable of giving out their contents by drops. These are allowed to fall upon a Skinner's mask just as in open-ether administration. The process is very useful as a preliminary measure, particularly with frightened children, who are easily rendered unconscious even by this highly diluted, very volatile vapour.

Post-anæsthetic poisoning[18] has been much discussed recently, and certain facts are gradually emerging from the obscurity in which the entire subject lay hidden. That the use of chloroform is particularly dangerous in cases where there is already a toxæmic state of the patient is one of these, and that acetonuria is extremely common without grave symptoms, is another.

Infusion Anæsthesia.—The method of inducing and maintaining anæsthesia by continuously infusing a solution of **Ether** in normal saline is being extensively tried.[19] The solution generally used is 5–7 per cent, and a vein at the bend of the elbow is commonly chosen. A hypodermic of scopolamine, morphia, and atropine is given beforehand, but even with this aid the process is sometimes insufficient for alcoholic or otherwise difficult subjects. In cases where the addition of fluid is in itself desirable, as in many instances of shock, the method has great advantages. Too much fluid, however, can in itself constitute a danger through œdema of the lungs. About a pint an hour is generally needed after anæsthesia has been induced. Rood states that if the solution is as strong as 10 per cent, a transient hæmoglobinuria may be caused. Post-anæsthetic vomiting and pulmonary irritation are very rare. In head and neck cases this method gives the advantage of placing the anæsthetist and his apparatus entirely away from the field of operation. **Hedonal**,[20] in 0·75 per cent solutions infused at the rate of about 100 c.c. to the minute, is similarly used. A prolonged state of drowsiness follows the use of this drug, and where blood is likely to be present in the air passages after operation, the patient needs special care during the recovery period. **Paraldehyde**[21] is the drug most recently tried for infusion anæsthesia. Experience with this, as with hedonal, is too scanty to allow definite pronouncements as to their real value.

Alkaloid Injections.—The combined use of alkaloidal substances and general anæsthetics is in much favour. **Scopolamine, Morphine,** and **Atropine** are commonly employed, either together or separately, and one or all of them are essential in most cases when "open ether" is to be the anæsthetic. Dudley Buxton[22] gives an excellent account of the history and of the pharmacological aspect of this mode of pro-

curing anæsthesia, in which he finds much to recommend. The preparation of the alkaloids of opium known as **Pantopon,** or "omnopon," is preferred by some to morphine, and is said to be less likely to cause any nausea or depression.[23] Common doses are: scopolamine, $\frac{1}{100}$ gr.; morphine, $\frac{1}{6}$ gr.; atropine, $\frac{1}{100}$ gr.; given hypodermically an hour before operation.

Fritz Sachs[24] has investigated the properties of scopolamine after keeping, and finds that in ampoules it is unaffected after some months, so far as its action on the central nervous system is concerned. In obstetric practice, where these drugs have been used in repeated injections to replace general anæsthetics altogether, it is found that the fœtus is adversely affected.

Narcophin has been applied to the same purpose (*page* 25).

References.—[1]*Presse Méd.* 1912, 577; [2]*Lancet*, 1911, i, 158; [3]*Ibid.* 582; [4]*Med. Rec.* 1911, June 3; [5]*Ibid.* 1910, Dec. 10; [6]*Ibid.* 1911, ii, 768 and *Therap. Gaz.* 1912, 405; [7]*Münch. med. Woch.* 1912, 794; [8]*Pract.* 1912, i, 406; *Brit. Med. Jour.* 1912, i, 597; *Ibid.* 1911, ii, 1646; [9]*Brit. Med. Jour.* 1910, Dec. 3; [10]*Quart. Jour. Med.* 1912, 339; [11]*Jour. Amer. Med. Assoc.* 1912, i, 1342; [12]*Lancet*, 1910, Nov. 19; [13]*Jour. Amer. Med. Assoc.* 1910, i, 775; [14]*Ibid.* 1911, ii, 1593; [15]*Lancet*, 1912, i, 215; [16]*Brit. Med. Jour.* 1912, ii, 432; [17]*Ann. Surg.* 1911, Feb. and June, 1912, July; [18]*Clin. Jour.* 1912, May 29; *Lancet*, 1910, Oct. 29; *Jour. Amer. Med. Assoc.* 1912, ii, 852; [19]*Brit. Med. Jour.* 1911, ii, 974 and 1912, ii, 608; [20]*Lancet*, 1912, May 11; [21]*Ibid.* 1912, ii, 818; [22]*Clin. Jour.* 1911, July 14; [23]*Lancet*, 1911, Feb. 11; [24]*Berl. klin. Woch.* 1912, 1415

ANEURYSM. (*See* Arteries, Surgery of.)

ANEURYSM, THORACIC.

Carey Coombs, M.D., M.R.C.P.

Etiology.—The paramount importance of syphilis as a cause of aortitis, and therefore of aneurysm, is generally agreed upon. Tedeschi[1] publishes figures to show that work in an overheated atmosphere also plays a part, acting in conjunction with syphilitic infection.

Symptoms.—Graham Steell's Bradshaw Lecture[2] is a mine of information as to the clinical features of intrathoracic aneurysm; from this standpoint the disease may be regarded as the commonest form of thoracic tumour. *Pain* is always present in some form; it may be referred to the areas associated with cardiac disease, and sometimes to that linked by Head with laryngeal lesions; it may be direct, e.g., from pressure on intercostal nerves; it may be bony, causing continuous breastache or backache. Sometimes it is referred to the occipital region, and may be very severe. *Dyspnœa* is of three chief types: the laboured inspiration due to tracheal or bronchial compression, the rapid breathing of alveolar obliteration, and the paroyxsmal dyspnœa which may imitate asthma, as in two cases recorded by Solis-Cohen.[3]

The *physical signs* vary widely according to the site and development of the aneurysm. For example, the lung compressed may be hyperresonant from temporary over-distension consequent on partial obliteration of the bronchus which supplies it; or it may be dull,

from collapse, " retention pneumonia " (alveolar catarrh with interstitial fibrosis), bronchial dilatation, diffuse fibrosis, suppuration, gangrene, or pleural effusion (though this latter is more often associated with new growth within the chest).

Even large aneurysms, yielding a wide area of dullness, may show no visible pulsation. Tracheal tug, if palpable only and not visible, is open to fallacy ; pulsatile depression of the larynx may sometimes be obvious to the eye, and if so is a most reliable sign. A palpable diastolic shock and its auscultatory equivalent, major accentuation of the aortic second sound, are almost the most important evidences of intrathoracic aneurysm. Steell says that the only clinical distinction between diffuse dilatation of the aorta and saccular aneurysm lies in the absence of pressure signs in the former.

A new physical sign is described by v. Hoesslin[4] and Hoffmann.[5] When the trachea is compressed by an aneurysm, expiration acquires the character of a series of jets ; each jet is produced by the diastolic expansion of the sac squeezing the trachea, so that there are four or five to each expiration. Associated with this there is the long-drawn stridor of inspiration well known in connection with these cases.

Hayes[6] writes enthusiastically of the value of *radiography* in diagnosis. He finds the screen of more value than the plate, since it reveals pulsations in aneurysmal shadows. The chest should be examined from every aspect ; the right anterior oblique position is of especial value, since it gives the observer a view of the profile of the aortic arch. A localized bulge in the outline of the pulsating aortic shadow should be looked for ; projection of the aortic shadow to the left, as seen in the antero-posterior view, is common in normal persons, and diffuse dilatation of the arch is almost the rule in hard-living men after fifty. In a case recorded by Sergent,[7] repeated *x*-ray examinations were of great value. The physical signs were those of aneurysm, but the first radiograph discovered a non-pulsatile shadow, and the diagnosis of syphilitic mediastinitis was made. Under suitable treatment, however, the shadow became thinner, and the presence of a pulsatile zone in its centre showed the case to be one of aneurysm complicated by mediastinitis.

Treatment.—The surgical attack by means of **Wiring** and **Electrolysis,** described in last year's Medical Annual, has been continued in America. Hare[8] gives an account of twenty-two cases so treated, and Finney[9] records twenty-three others. Lusk's[10] paper describes one case in detail, with a series of experiments on animals. One of Hare's cases survived five years after operation, and one of Finney's was alive three years later. Hare claims that the immediate relief of pain justifies the procedure, and Finney says " the vast majority are improved, the improvement lasting from a few days to a term of years. A few cases can be truthfully claimed as cured. A good deal, of course, depends on what constitutes a cure." [Against these very doubtful benefits—no greater than other methods might have achieved—must be balanced the fact that many of the patients died

soon after the operation. In face of this, we think the procedure has had a fair trial, and having failed to achieve cure in a reasonable percentage, should now be discarded.—C. C.]

Stacey Wilson[11] records good results obtained in seven cases by the old-fashioned orthodox plan of absolute **Rest, Reduced Diet** (fluids less than one pint daily), and **Potassium Iodide** in rising doses, up to 1 dr. three times daily.

REFERENCES.—[1]*Presse Méd.* 1912, 180; [2]*Lancet*, 1911, ii, 1605; [3]*Inter. Med. Jour.* 1912, Jan.; [4]*Münch. med. Woch.* 1912, 24; [5]*Ibid.* 368; [6]*Med. Press & Circ.* 1912, i, 615; [7]*Presse Méd.* 1912, 569; [8]*Jour. Amer. Med. Assoc.* 1912, i, 1088; [9]*Ann. Surg.* 1912, i, 661; [10]*Ibid.* 789; [11]*Birm. Med. Rev.* 1911, 209.

ANGINA ABDOMINIS. *Carey Coombs, M.D., M.R.C.P.*

Occasionally elderly persons with or without manifest arterio-sclerosis are vexed by recurrent attacks of violent abdominal pain, sudden, and as a rule brief, often provoked by exertion, and also resembling angina pectoris in their excruciating severity. To pain of this kind, referred in their patient to the umbilicus, Brunton and Williams[1] give the title "angina abdominis." Like many of the Continental physicians, they regard disease of the gastro-intestinal blood-vessels as the cause, in the same way as coronary sclerosis is responsible for attacks of breast-pang. Lagane[2] thinks that two types of arterial lesion are to be distinguished; that implicating the vessels of the intestinal wall, which he refers to infections of the bowel in early life, and atheroma of the mesenteric arteries. Both conditions lead first to paroxysmal disturbances, sensory, motor, or secretory in type; and later to organic changes, intestinal ulceration in the first group and mesenteric infarction in the second. The conclusions of Frugoni[3] are practically identical with these.

Dunham,[4] describing a series of such cases, insists on the importance of measuring the blood-pressure and examining the urine for casts, in patients with obscure abdominal pain occurring in paroxysms. Accompanied as it may be by flatulence, vomiting, diarrhœa, or even obstruction, this pain may easily be mistaken for that of biliary colic, duodenal ulcer, appendicitis, and so forth; whereas it is due, in Dunbaw's opinion, to spasm of diseased arteries. He claims support to this theory from Pal's observation of the rise of arterial pressure in the gastric crises of tabes. It is interesting in this connection to read of Friedmann's[5] case, in which abdominal attacks of this type were associated with paroxysms of intermittent limp, which is known to be due to disease of the popliteal artery.

Hunter[6] and Held,[7] on the other hand, describe similar attacks of epigastric pain occurring in patients with coronary disease demonstrated post mortem, which they look upon as directly cardiac in origin, but referred to the upper abdomen. Manges[8] takes the view that abdominal pain of this kind may be due to arterial disease, sometimes in the heart, sometimes in the alimentary tract. This is the view that will commend itself to most observers.

TREATMENT.—Whatever the actual site of the arterial disease, there is no doubt of the value of the **Nitrites** in alleviating the pain of the attacks. Dunham, indeed, finds the relief so prompt as to be of diagnostic importance. Held also extols **Diuretin,** gr. 10, thrice daily, but Hunter found it useless in his case. **Sodium Iodide** may also be given, and the general lines of treatment should be those used in arteriosclerosis.

REFERENCES.—[1]*Lancet*, 1912, i, 921; [2]*Presse Méd.* 1912, 150; [3]*Gaz. deg. Osped.* 1911, 1331; [4]*Med. Rec.* 1912, i, 16; [5]*Berl. klin. Woch.* 1912, 2028; [6]*Lancet*, 1912, ii, 12; [7]*Med. Rec.* 1912, ii, 366; [8]*Amer. Med.* 1912, i, 152.

ANGINA PECTORIS.

Treatment by **Diathermy** is recommended (*page* 76).

ANGIONEUROTIC ŒDEMA. *E. Graham Little, M.D., F.R.C.P.*

Five cases of the complex of symptoms described under the above head are reported by Wiel,[1] who arrives at the opinion that angioneurotic œdema is not a specific disease; in four of the cases gastro-intestinal symptoms and abdominal pain were observed; in the fifth the patient suffered and finally died, from general tuberculosis.

TREATMENT.—The most successful method of checking the irritation and swelling was application of compresses of solution of **Aluminium Acetate,** or Argyrol (20 per cent), or **Boric Acid,** or **Calamine lotion.** An ointment which relieved more materially than any other treatment was constituted as follows: anæsthesin 1 part, zinc oxide 1 part, lime-water 8 parts, oil of sweet almonds 16 parts.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1246.

ANKYLOSTOMIASIS. (*See* UNCINARIASIS.)

ANTHRAX. *Herbert French, M.D., F.R.C.P.*

The question of the best way of treating anthrax has comparatively recently been settled so far as Great Britain is concerned in favour of the use of **Sclavo's Anti-anthrax Serum**; some observers hold that it is unnecessary to excise the malignant pustule at all, though most still do so in addition to giving the serum. Upon the Continent, however, opinions are not nearly so unanimous, and there have recently been several papers discussing the subject. Amongst these may be mentioned in particular those by H. Wolff and O. Wiewiorowski[1] and M. L. Boidin.[2] The latter gives an elaborate résumé of the pros and cons of conservative treatment, treatment by pyocyanase, serum therapy, and treatment by salvarsan, and he records numbers of experiments on animals to test their value. He is quite emphatic as to the value of Sclavo's serum, and gives examples of the cure of patients by it when the disease was no longer localized, but had entered upon the last stage, namely, that of anthrax septicæmia. This leaves little ground for alternative measures except under circumstances when Sclavo's serum might not be available. Those observers who have used **Pyocyanase** claim much merit for it. The treatment was

suggested from the fact that animals that received simultaneous injections of *Bacillus pyocyaneus* and of *B. anthracis* did not die as readily as did those who received the same doses of *B. anthracis* alone; and it was found that a vaccine prepared from *B. pyocyaneus*—spoken of as pyocyanase—also has the power of lessening the ill-effects of anthrax inoculations in animals. One or two cases of malignant pustule in man have been treated with pyocyanase with good results. Certain cases, however, do well even when no very drastic measures are adopted, and Wolff and Wiewiorowski[1] have recently recorded thirteen severe cases with extensive ulceration of the arm or other parts, in which cure resulted from such simple treatment as local **Boric Acid Fomentations** or other conservative antiseptic application, without excision, serum, or vaccine. Six of these cases were very severe, seven were less so. They give full notes of each, and four photographic representations of the lesions, which were certainly extensive, and they conclude that it is safe to adopt conservative treatment without resorting to drastic measures. Notwithstanding the excellent results they obtained, however, a feeling remains in favour of the giving of Sclavo's serum, even though the focal pustule be not excised.

E. Gräf[3] publishes statistics of the conservative treatment of external anthrax by simple cauterization with solid **Caustic Potash.** The potash stick should not be used with a point, but should be broken off square and rubbed with firm pressure over the part affected for about a full minute, until the hard part of the pustule and its surrounding infiltration have, so to speak, melted so as not to be felt as markedly indurated as before, while the base of the cauterized surface shows reddish through the brown shade of the mixed caustic and bloody serum. The alkali, he says, has a great advantage over the actual cautery, Paquelin's or otherwise, in that it does not produce a hard eschar, the surface remaining more or less liquid. He finds that the œdema subsides in about twenty-four hours after the application of the caustic, and the patients, for the most part, get perfectly well. The rapid subsidence of the œdema is a remarkable feature. In one year he treated seventy-five cases in this way, four ending fatally, ten recovering after a severe general illness, and the remaining sixty-one running the following course: twenty-four hours after the application of the caustic the angry malignant pustule changed into a simple-looking scab, the patient not suffering from any constitutional symptoms and being able to continue his work, provided the scab was not on any part which interfered mechanically with his doing so. It would seem, therefore, that the caustic potash treatment of anthrax is worth trying in places where no Sclavo's serum can be obtained; but Gräf himself lost four cases out of seventy-five, and this, though a small mortality as compared with former statistics, is large compared with that following the serum treatment with or without excision.

Salvarsan has been used tentatively in the treatment of anthrax both in animals and man, but there are as yet no figures to show that

it is preferable to serum. Gustav Schuster,[4] having experimented upon rabbits, came to the conclusion that the giving intravenously of an amount of salvarsan equivalent to 0·04 gram per kilo body weight saved the animals from being killed by otherwise fatal doses of anthrax bacilli given at the same time, and he refers to a patient suffering from anthrax who was cured by the intravenous injection of 0·6 gram of "606."

Bettmann and Laubenheimer[5] record human cases of anthrax recovering after salvarsan treatment, and also beneficial effects from the use of the drug given to animals experimentally inoculated with anthrax bacilli. In the two patients referred to by them, anthrax bacilli of a virulent type were found in the lesions before the salvarsan was given, but after doses of 0·3 gram and 0·4 gram of "606" respectively, the bacilli rapidly disappeared from the local lesions and the patients recovered.

A. S. Gubb[6] records two further cases in which, after salvarsan treatment (0·3 gram intravenously), cure resulted; in each of these there was no immediate improvement in the local lesions, and nineteen hours after the injection rich cultures of anthrax bacilli were recovered, but the following day improvement set in, especially in respect of the œdema; the centre of the anthrax carbuncle rapidly became converted into a scab; a second injection of 0·4 gram of salvarsan was given in each case; the next day no anthrax bacilli could be recovered from the remains of the pustule. Recovery was uninterrupted. In a paper by M. L. Boidin,[2] however, there are references to cases in which the use of salvarsan seemed to exert no beneficial effects, and the patients died.

One is left, therefore, with the conclusion that although some cases of malignant pustule may get well without more than conservative antiseptic treatment locally, and although some are benefited by such remedies as pyocyanase or salvarsan, the method most likely to save life in consecutive cases, and in which, therefore, most trust can be placed, is Sclavo's anti-anthrax serum.

References.—[1]*Münch. med. Woch.* 1911, 2787; [2]*Presse Méd.* 1912, 677; [3]*Münch. med. Woch.* 1912, 870; [4]*Ibid.* 1912, 349; [5]*Deut. med. Woch.* 1912, 349; [6]*Med. Press*, 1912, 666.

APHONIA.

(*Vol.* 1912, p. 380)—This trouble, when due to impairment of nervous tone and muscular balance, has been successfully treated by application of mild currents of **Faradic Electricity.** "The secret of success is in the regular and persistent use of mild currents which are not calculated to produce violent contractions of opposing healthy muscles."

APPENDICITIS. *Sir B. G. A. Moynihan, M.S., F.R.C.S.*
H. Upcott, F.R.C.S.

Billington[1] holds that there is no great difficulty in the diagnosis of appendicitis, but it is the element of uncertainty as to its future course which constitutes the anxiety associated with the disease.

The *type of patient* attacked must be the deciding factor in the

question of delay or prompt operation. In Billington's opinion delay is dangerous and unjustifiable in children under twelve years of age and adults over forty. One of the reasons why a higher proportion of children diagnosed as suffering from appendicitis develop dangerous symptoms is probably because the milder forms of the disease are more often overlooked owing to the frequency of attacks of abdominal pain in children. Only the more severe forms of appendicitis are recognized as such, and they should be dealt with accordingly.

Delay is often urged in elderly patients on account of the risk of operating upon a person of advanced years. But it must be remembered that if such a person becomes worse, to the risk of his years is added the far graver risk of a dangerous illness, and under such conditions an operation may fail to save him. As a matter of fact, interval appendicectomy in patients over forty has no higher mortality than in younger individuals. At the onset of an acute attack in such patients the decision must be made at once—either operate immediately or (on account of fatness, cardiac weakness, etc.) put aside the question of surgical treatment altogether ; the patient will be no better able to bear an operation to-morrow.

In the summer of 1911, Grant Andrew advocated the immediate closure of the abdominal wound after operation for acute appendicitis, and reported 17 cases so treated. One patient died. Of the remaining 16, eight healed by first intention, and in the other eight there was some degree of septic infection of the wound.

Since then he has endeavoured[2] still further to reduce the incidence of *wound infection*. The patients receive an injection of stock **B. Coli Vaccine** either before or directly after operation. The abdomen is opened by a muscle-splitting incision, and the wound is filled with **Iodoform Emulsion** before opening the peritoneum. The appendix is removed, all local exudate wiped away, and the seat of the disease treated with the iodoform emulsion. The wound is then completely closed. In seven consecutive cases so treated, primary healing occurred. Five of these were cases of gangrenous appendicitis with diffuse sero-purulent exudate (in one a drainage tube was inserted through a posterior incision for forty-eight hours), and two were cases of localized abscess.

A most instructive analysis of 500 operations for acute appendicitis by Burgess[3] shows well how the mortality is affected by the time which elapses between the onset of acute symptoms and operation. Under twenty-four hours the mortality is 3·03 per cent. It then shows a progressive increase with each successive day up to the sixth day. Of five deaths occurring in patients operated on within forty-eight hours, three were due to acid intoxication, as was also one other case in the series. All these four were anæsthetized with chloroform.

When the infection appeared limited to the appendix, the mortality was under 1 per cent. In the presence of diffuse spreading peritonitis, it was nearly 20 per cent. The cases with localized abscess showed a mortality of from 4 to 5 per cent. Burgess is in favour of removing

the appendix in these cases at the time of opening the abscess, and his figures support his contention that this does not increase the danger. If the abscess has been reached through the healthy peritoneal cavity, it may be thoroughly protected with gauze packing, and the search for the appendix safely undertaken.

Burgess follows Murphy's description of the order in which symptoms appear: (1) Abdominal pain; (2) Nausea and sometimes vomiting; (3) Local tenderness; (4) Local rigidity; and (5) Rise of pulse-rate and temperature, though he thinks that (5) were better omitted, for their absence does not discount the diagnosis; moreover, it is not necessary to wait for (4) to complete the diagnosis, for the local rigidity is only an indication that infection has spread beyond the appendix. He emphasizes the importance of the "**Fowler Position**" as soon as the diagnosis is made. A most important step in the operation is first to isolate the infected area by means of gauze packing. The appendix is then removed, all pus wiped away, and the stump treated, if possible, as in an interval operation. If the stump cannot be buried it is simply ligated, and a drainage tube is left in the wound.

The condition of the appendix after abscess formation has been studied by Dodds-Parker[4] with a view to ascertaining what advice to give patients after recovery from the drainage of an appendix abscess. He gives a table of 17 cases of his own in which appendicectomy had been performed after the healing of an abscess. These appendices were not destroyed and showed no obliteration of lumen. Various gross pathological lesions were found, adhesions, kinks, and scars, showing that they were liable to give rise to further attacks. In some cases multiple outbreaks of appendicitis occurred after the abscess had been opened and drained, and sometimes several years have elapsed between the attacks. He concludes that it is wiser to remove such diseased appendices after recovery from the abscess; these secondary operations present no great danger, and they allow of the cure of any ventral hernia which may have formed.

Although the occurrence of *Oxyuris vermicularis* within the appendix is comparatively common, recognized cases of appendicitis caused by this worm are infrequent. Ney[5] records two cases where acute symptoms, with severe pain and local tenderness, led to a diagnosis of acute appendicitis and to operation. In each case the appendix was removed, though it presented no signs of acute inflammation. In one case two, and in the other five thread-worms crawled out of the appendix when opened. Microscopical examination showed catarrhal appendicitis. Ney thinks that some cases of acute inflammation of the appendix may have their starting-point in injury to the mucosa by these worms.

X-Rays may be useful in the diagnosis of appendicular disease (*page* 53).

References.—[1]*Brit. Med. Jour.* 1912, i, 1170; [2]*Ibid.* 1172; [3]*Ibid.* 416; [4]*Lancet*, 1912, i, 350; [5]*Johns Hop. Hosp. Bull.* 1912, 123.

ARRHYTHMIA. (*See* AURICULAR FIBRILLATION, *and* HEART, DISEASES OF.)

ARTERIES, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Ligation of the Common Iliac Artery.—Halsted[1] reports a case of cure of *ilio-femoral aneurysm* by the application of a barely or completely occluding aluminium band to the common iliac artery, and also reviews the literature of common iliac ligature. Since the first operation, in 1812, this vessel has been tied about 100 times.

The *indications* for which it has been tied are grouped as follows by Stephen Smith: (*a*) For the arrest of hæmorrhage (eleven cases; ten deaths, one from peritonitis); (*b*) For the cure of aneurysm (fifteen cases; ten deaths); (*c*) For the cure of pulsating malignant growths mistakenly diagnosed as aneurysms; (*d*) For the prevention of hæmorrhage in the removal of a morbid growth.

Halsted's patient was a man, aged forty-four, with a large aneurysm of the external iliac and femoral arteries. The common iliac artery was reached by a transperitoneal incision, and after the vessel had been isolated, it was raised from its bed by two narrow tapes, and an aluminium band, 6 cm. wide, was passed under it and curled. The patient made a good recovery, and three and a half years after the operation wrote saying that all trace of the aneurysm had disappeared; but the limb operated on was much weaker than the right, and became cold and painful on walking. In only two out of thirty cases of ligation of the artery did gangrene occur. He thinks a fatal termination might have been avoided in a considerable number of cases if the vessel had been temporarily compressed, and the precise condition investigated at the first operation.

Arterio-venous Anastomosis.—Bernheim[2] reviews the literature of arterio-venous anastomosis, and reports six additional cases. It has been suggested that a true and complete renewal of the blood-current is never attained, the blood simply being shunted off to another vein and promptly returned to the heart without ever getting to the foot or hand.

A careful search of the literature has revealed forty-six cases (and six of Bernheim's) of arterio-venous anastomosis. Out of these fifty-two patients, thirty-eight were males, ten females, and in four the sex was not stated; the ages varied from twenty to eighty years. There were fifteen successes, the reversal, as far as can be judged, actually saving the limb from gangrene, real or threatened—a percentage of 30. Among the failures there were thirteen deaths, two from shock and eleven from senility and erysipelas. In the remainder the course of the disease was uninfluenced by the reversal, although there was a temporary improvement in several cases. The operation was done twice in the upper extremity, once for thrombus and threatened gangrene, and once for threatened gangrene. Both were successful. The end-to-end suture of Carrel and Stich was used twenty-three times, with eight successes; lateral anastomosis twelve

times, with four successes; invagination (end of artery into end of vein) twice, with one success; and the intubation of Wieting (end of artery into side of vein) nine times, with two successes.

Bernheim agrees with Wieting in believing that the method of choice for reversal will be a lateral anastomosis; and in conjunction with Stone[3] he has advocated a method whereby the artery and vein

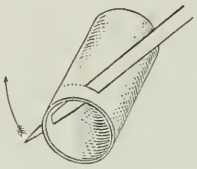


Fig. 1.—Introduction of knife and direction of incision of arterial wall.

Fig. 2.—Gaping of transverse incision in arterial wall.

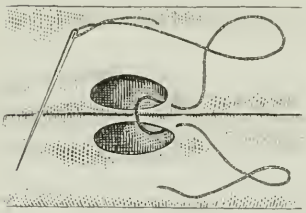


Fig. 3.—Initial suture placed.

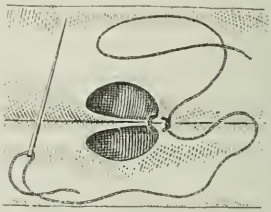


Fig. 4.—Initial suture tied.

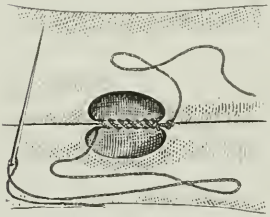


Fig. 5.—Finishing posterior part of continuous suture.

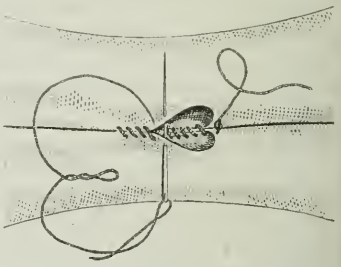


Fig. 6.—Posterior part of suture completed and about half of anterior part placed.

are incised transversely through one-third of their diameter, and then sutured (*Figs.* 1–6). Following the suture, and before turning on the blood-stream, the vein is tied off proximal to the site of anastomosis, to prevent back-flow to the heart. The flow through the artery is not interfered with in any way, the only thing that happens being an added arterial channel through the vein. Clinical experience alone will show whether this method is of any value. A most important

factor to be considered is the skill and experience of the operator, and Bernheim believes that many of the failures are due to faulty technique. Wide experience gained by operation on living animals is an absolute necessity to the surgeon who wishes to do clinical work in the field of vascular surgery.

REFERENCES.—[1]*Johns Hop. Hosp. Bull.* 1912, 197; [2]*Ann. Surg.* 1912, ii, 195; [3]*Ibid.* 1911, i, 496.

ARTERIOSCLEROSIS. (*See also* ANGINA ABDOMINIS; BLOOD-PRESSURE.)

Carey Coombs, M.D., M.R.C.P.

ETIOLOGY.—Herz,[1] of Vienna, wrote to a number of Austrian practitioners by way of collecting information as to the causation of arteriosclerosis. Nervous and psychic influences head the list, followed by age, alcohol, syphilis, metabolic disorders, and physical labour. Tobacco and heredity also ranked high; but in some districts where alcohol and tobacco are widely used in excess, there was a noteworthy absence of arteriosclerosis.

Bishop[2] regards intestinal putrefaction as the prime factor, as indicated by the presence of indican in excess in the urine of arteriosclerotics. He says that the validity of this theory is further established by the success of treatment directed to removal of fermentation in the bowel.

Various researches[3] go to show that nicotine, heavy work, and infections, all of them causes of arteriosclerosis, act by stimulating the adrenals to formation of an excess of secretion which exercises an injurious action on the arterial walls.

TREATMENT.—Lydston[4] thought that **Thiosinamine,** in doses rising from gr. $\frac{1}{5}$ to gr. 1, three times daily, softened the palpable vessels of an elderly arteriosclerotic. The patient, however, died in uræmic coma not long after, in spite of the treatment.

Loewy[5] finds **Iodtropon** valuable. If the blood-pressure is raised, a considerable fall is induced, and the pains and other subjective symptoms are distinctly relieved. He gives three or six tablets daily, each containing ·05 gram of iodine, for three weeks.

Radio-active Baths are said to be of benefit to arteriosclerotics (*page 72*).

REFERENCES.—[1]*Wien. klin. Woch.* 1911, Nov. 2; [2]*Med. Rec.* 1911, ii, 512; [3]*N.Y. Med. Jour.* 1912, i, 1152; [4]*Therap. Gaz.* 1912, 466; [5]*Deut. med. Woch.* 1912, 1091.

ARTHRITIS. (*See* RHEUMATOID ARTHRITIS.)

ARTHRODESIS AND ARTHROLYSIS. (*See* JOINTS, SURGERY OF.)

ASCITES.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Castle[1] describes an operation for draining the peritoneal cavity into the femoral vein in cases of ascites (*Fig. 7*). The saphenous vein is dissected out of its bed, cut across distally (A), and left attached to the common femoral at its upper end. The abdomen is now opened,

and the isolated vein drawn through the subcutaneous tissues (B,) until its end can be made to project through a small opening in the parietal peritoneum to which it is sutured (D, E, F). The small curved incision at the upper part of the thigh is designed to prevent kinking of the vein in its new course. In suturing the abdomen, the omentum is caught up to prevent it occluding the new channel.

Speaking on the subject of **Omentopexy,** Morison[2] says the most suitable cases are those of alcoholic cirrhosis in patients otherwise sound, whom repeated tapping has failed to cure. None of these cases, in his experience, have been failures. The reason is probably because the predisposing cause—alcohol—can be removed. He has had no cures among cases with ascites from syphilitic cirrhosis.

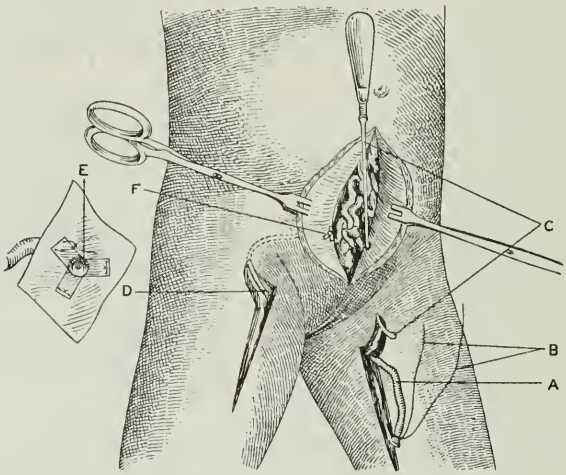


Fig. 7.—Venoperitoneostomy for relief of ascites.

The steps of the operation are: (1) Open the abdomen from the ensiform cartilage to the umbilicus; (2) Introduce the hand into the abdomen and project a finger against the anterior parietes in the middle line three inches above the pubes; (3) Make a small incision on to the finger tip, and through this introduce a long small glass tube into the recto-vesical or recto-uterine pouch; (4) Dry the abdominal cavity and scrub the peritoneum with mops; (5) Suture the omentum to the anterior parietal peritoneum across the abdominal wall, and close the upper abdominal wound; (6) Apply an antiseptic dressing over the wound and tube, and over this, from above down to the tube, a series of long circular strips of adhesive strapping, with the object of keeping the parietal in contact with the visceral peritoneum; (7) The tube now exposed through the dressings is surrounded with a sheet of dental rubber perforated to grasp it below the collar on it,

and the separated tube dressing is wrapped up in the india-rubber sheet.

A more direct method of short circuiting the portal blood into the systemic circulation is by means of an Eck's fistula. An improved technique for establishing an Eck's fistula is described by Bernheim and Voegtlin,[3] who have experimented on dogs. They found that these dogs, if kept on a proper mixed diet, live for a long time without being influenced by the operation. Since the danger of intoxication from errors of diet is remote in the human being, they see no reason why the operation should not be used in the treatment of ascites.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 2123; [2]*Brit. Med. Jour.* 1912, i, 113; [3]*Johns Hop. Hosp. Bull.* 1912, 46.

ASTHMA. (*See also* LUNGS, SURGERY OF.)

J. J. Perkins, M.B., F.R.C.P.

TREATMENT.—Chiari and Januschke[1] strongly recommend **Calcium Lactate** for its beneficial effects in the treatment of asthma. The dose employed was from 3 to 4 grams daily, and the effect was noticed in about two days. Other writers have had the same experience. Kayser[2] found that only one out of fourteen refractory cases of asthma remained uninfluenced, while Hoffmann[3] bears the same testimony but notes that smaller doses are ineffectual. The dosage then must evidently be large, and cases of nasal origin are the most amenable to its action.

Ephraim[4] reiterates the value of **Adrenalin** in the treatment of asthma, to which attention has been drawn in previous volumes of the MEDICAL ANNUAL. Given at the start of the attack, its effects are very prompt; a dose of 5 min. of the 1–1000 solution in his experience relieves in a few minutes regularly. He has seen no ill effects from its use even when employed for many weeks on end. It must, however, be given by injection, the results from its inhalation being poor. But though its immediate effects are so good, he cannot find any evidence of its permanent value: it does not prevent the return of the attack; though in one case six injections were given in one day, the beneficial effects of none lasted over two hours.

On observing the mucosa through a bronchoscope, he found pallor and diminution of the swelling, but this did not last for more than two and a half minutes after the injection. He believes that adrenalin not only relieves the spasm of the bronchi but diminishes the swelling and actually facilitates expectoration. The direct application of adrenalin to the nasal mucosa leaves a much more lasting effect than follows hypodermic injection, and Ephraim conceived the idea of observing through the bronchoscope whether the same held good after its local application to the bronchi. He found that the effects of the local application were infinitely superior both in intensity and duration. Secretion was more abundant, and a lasting alleviation of the asthmatic symptoms followed. The action appears to be a purely local one, for he could find no evidence of any marked raising of the blood-pressure. He considers adrenalin a more useful expectorant in chronic

bronchitis, even when not of asthmatic origin, than potassium iodide or any other drug.

Lemann[5] is another strong adherent of the use of **Adrenalin Chloride** in asthma, considering it the most efficacious drug we possess next to morphine. In successful cases its action is nothing short of marvellous, relief beginning even before the hypodermic needle can be withdrawn. He has made careful observations, and has satisfied himself that adrenalin is practically without effect on the blood-pressure, and is therefore free from the disadvantage and danger which have been laid at its door.

Göppert[6] advocates the use of **Urethane** in the spastic bronchitis of children, which is very near akin to asthma. The condition he refers to is one of intense dyspnœa, heralding an attack of acute bronchitis into which it afterwards develops. He has obtained most strikingly good results in the relief of these distressing symptoms, and has not been afraid to give as much as half a gram to a child three weeks old. Almost immediate improvement followed, and in three-quarters of an hour the cyanosis had disappeared, the skin was warm, and the dyspnœa greatly modified. In another of the cases quoted, that of a child of nine months, an hour's quiet sleep followed the administration of $1\frac{1}{2}$ to 2 grams by the mouth. Subsequently half a gram was given three times a day. Other similar cases are quoted, and he has never seen any ill result follow its use. The doses he employs are, by the mouth, half a gram at three months, rising to $1\frac{1}{2}$ at one year old, and 2 grams at two years of age. By enema the dose is doubled, and can be repeated every quarter of an hour.

Counter-irritation (*page* 11) and **Transduodenal Lavage** (*page* 21) are also advocated by certain writers.

References.—[1]*Arch. f. Exp. Path. u. Pharm.* 1911, lxv, Apr.; [2]*Ther. Monats.* 1912, xxvi, pt. 3; [3]*Münch. med. Woch.* 1912, 1152; [4]*Deut. med. Woch.* 1912, 1453; [5]*Amer. Jour. Med. Sci.* 1911, ii, 865; [6]*Berl. klin. Woch* 1912, 791.

AURICULAR FIBRILLATION. (*See* also Heart, Diseases of.)

Carey Coombs, M.D., M.R.C.P.

This term is widely used at the present time, and though it does not connote a distinct morbid entity, it may be well to describe the syndrome to which it applies, together with the appropriate treatment. The account given here is largely based on papers by Mackenzie[1] and Emanuel.[2]

When the work of Mackenzie, Wenckebach, and others reduced the knowledge of cardiac arrhythmia, its various types and the causation of each, to something like exactitude, there emerged one large class of cases to which the name of "total irregularity" or "arrhythmia perpetua" (Hering) was given. These two titles sufficiently describe its chief characteristics; the pulse is altogether irregular, and continues to be so (except in a few instances where its aberration is paroxysmal or periodic). The work of Thomas Lewis[3] and of Rothberger and Winterberg[4] has firmly established the relationship between

this abnormality and " auricular fibrillation," i.e., replacement of the co-ordinated movements of the auricles (systole and diastole) by diffuse irregular twitching motions comparable to the fibrillary tremor of atrophied skeletal muscle.

Etiology.—The commonest antecedent by far is rheumatic heart disease ; auricular fibrillation, with its attendant irregularity of pulse, constitutes the final phase of mitral stenosis, which, in its turn, must be regarded as the residual lesion *par excellence* of rheumatic carditis. This phenomenon may also mark the termination of the cardiac failure consequent on diffuse arterial disease. Price and Ivy Mackenzie[5] note its occurrence in a case of diphtheria.

Pathology.—The onset of auricular fibrillation coincides with that of auricular asystole, as will be shown below. Does fibrillation cause asystole, or vice versa ? or are both phenomena to be ascribed to some common cause ? and if so, what is that cause ? In looking for an answer to these questions, recourse has been had to experiments and also to microscopy of the auricular tissues. It is enough to say here that two theories have emerged, and that so far the direct evidence does not prove either. One school has found lesions in and about the sino-auricular node—that neuro-muscular junction which, being situated at the upper extremity of the cardiac tube, has been proved to be the " pace-maker " of the heart from which the stimuli, subsequently conducted downwards through the auricles into the ventricle, primarily originate (Cohn,[6] Draper,[7] Freund,[8] and others). On the other hand, there are those who, like Ivy Mackenzie,[9] find a satisfactory etiology in the widespread degeneration of the auricular musculature found in these cases. Whichever the cause, the result is that stimuli are produced haphazard in the auricular walls, and are showered thence into the ventricle, the responses of which are therefore irregular, occurring whenever its muscle has passed out of the preceding refractory stage without due diastolic rest.

Symptoms.—There are two cardinal features. (1) The pulse becomes totally irregular. To this general rule there is one exception ; if, owing to heart-block by digitalis or organic disease of the auriculo-ventricular connecting bundle, the irregularly generated impulses are altogether stopped in their passage from auricle to ventricle, the result is an idioventricular rhythm, regular and slow (thirty to forty per minute). These cases are exceptional, and the pulse is usually rapid and quite irregular both in force and frequency. As Silberberg[10] remarks, there is also irregularity of arterial tension, so that sphygmomanometric observations should not be confined to single readings. (2) All evidences of auricular systole disappear. (*a*) If the case be one of mitral stenosis, the presystolic thrill and murmur cease to be perceptible with the onset of fibrillation. Care must be taken to distinguish the diastolic thrills and murmurs which are often to be found at the apex in mitral stenosis ; these, being ventriculo-diastolic in origin, persist even after fibrillation has begun. (*b*) The " A " (auriculo-systolic) wave of the jugular tracing disappears,

and nothing remains but a series of undulations falling within the auriculo-diastolic period; sometimes this includes a series of very fine vibrations, directly depicting fibrillations as transmitted through the blood column from the auricle to the jugular vein. (*c*) The "P" (auriculo-systolic) wave of the electrocardiogram fails, and its place is taken by an irregular series of finer movements representative of fibrillation.

The *onset* is abrupt in many cases: sometimes it occurs in brief paroxysms before settling down to permanency; occasionally, as in Simpson's[11] patient, it is preceded by a period of auricular extrasystolic arrhythmia.

Diagnosis.—In most cases it is enough to note that late in the course of a case of mitral stenosis or cardiosclerosis the pulse has become totally irregular and the general condition graver, while the presystolic thrill and murmur, if previously present, have disappeared. Sometimes, however, total irregularity of the pulse may be simulated by complex extrasystolic arrhythmia, by an unusually extreme sinus irregularity, or by a compound of these two. Such may, however, be distinguished from the true "*arrhythmia perpetua*" by the use of the polygraph. The graphic record shows the absence of any auriculo-systolic wave from the jugular curve in the latter, and its presence in the spurious forms.

Prognosis.—Mackenzie has stated that in more than two-thirds of all cases of heart failure from chronic cardiac disease the determining factor is auricular fibrillation. Its onset is a bad prognostic feature; on the one hand it proves the existence of advanced disease of the auricular wall, while on the other it is a source of embarrassment to the ventricle, which is unable to secure for itself adequate or regular diastolic rest owing to the rapid unruly stream of stimuli which pours down upon it from the fibrillating auricle. Once established, this irregularity usually persists till death; sometimes treatment may secure rehabilitation of the normal rhythm, and practically always much relief can be afforded and life prolonged by adoption of the right measures.

Treatment.—Mackenzie does not think it absolutely necessary to put the patient to bed in every case; however, most physicians find it convenient to do so whenever possible, if only for the sake of continuous observation. The use of **Digitalis** is always indicated; indeed, it is in the presence of this syndrome that it is chiefly of value. Mackenzie uses a reliable tincture, beginning with 1 or 2 dr. daily, and continuing till the pulse-rate lies between seventy and fifty per minute, or till vomiting interferes. Sometimes Nativelle's crystalline **Digitalin** seems preferable to the tincture. As for **Strophanthin,** Cushing[12] thinks it of value where *immediate* relief is urgently necessary; in such cases a dose of gr. $\frac{1}{250}$ to gr. $\frac{1}{100}$ may be given intravenously, and the benefit thus secured maintained by a course of digitalis. Agassiz,[13] after a careful study, comes to similar conclusions. He says the injections may excite fever and local irritation. The first dose should be

gr. $\frac{1}{250}$, followed three hours later by a similar dose, with another dose of gr. $\frac{1}{500}$ after another three hours if necessary. Mackenzie, however, does not care for strophanthin; he thinks digitalis is practically never toxic, and that when it fails strophanthin and all other members of the digitalis group will fail also. It is said that post-rheumatic cases respond better to digitalis than cardiosclerotic ones, but Emanuel has found the drug satisfactory in both conditions.

Once begun, the continuance of digitalis treatment is conditional on the patient's comfort when up and about. Patients soon learn to know whether they need to be taking the drug at all, and if so, how much. Of course, it is necessary to keep them under periodical supervision meanwhile; but it is astonishing what can be done and borne by a patient with total irregularity due to auricular fibrillation, provided he is a judicious user of digitalis. The bowels should be kept open by regular aperients, the fluid intake must be limited, and all sudden or strenuous exertion forbidden.

For recent research into the action of **Digitalis** and **Digalen,** *see pages* 11, 12.

REFERENCES.—[1]*Brit. Med. Jour.* 1911, ii, 869; [2]*Ibid.* 1912, i, 531; [3]*Heart,* 1910, i, 302; [4]*Wien. klin. Woch.* 1909, 834; [5]*Heart,* 1912, iii, 233; [6]*Ibid.* 1911, iii, 23; [7]*Ibid.* 13; [8]*Deut. Arch. f. klin. Med.* cvi, parts 1 and 2 (*Deut. med. Woch.* 1912, 963); [9]*Quart. Jour. Med.* 1912, v, 520; [10]*Brit. Med. Jour.* 1912, i, 775; [11]*Austral. Med. Gaz.* 1912, i, 329; [12]*Brit. Med. Jour.* 1912, ii, 684; [13]*Heart,* 1912, iii, 353.

AXILLÆ, SWEATING IN.

(*Vol.* 1912, p. 332)—The armpits may be bathed with weak **Vinegar** in the mildest cases, after which the following dusting powder may be applied on a pad of plain gauze: salicylic acid 20 gr., powdered starch 2 dr., alum to 1½ oz. In other cases **Lysoform** lotion (½ to 5 per cent, twice daily) or Brocq's **Naphthol-Glycerin** lotion may be used. In obstinate cases application of **X-rays** has proved valuable.

BACILLURIA.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Williams, Murray and Wallace[1] publish an investigation into the coliform organism occurring in the female urinary organs. They have examined the urine in females before and after gynæcological operations, and in the former obtained relatively few discrete colonies in 42 per cent. After operation, growth occurred in 92 per cent, and many of the plates were overcrowded. To combat the possible suggestion that catheterization had been the activating cause, they took urine from the bladder by aspirating from the abdomen during operation, with similar results. Numerous strains of coliform organisms were isolated, and in the case of organisms culturally identical they were able by serum agglutinative tests to demonstrate that even among these the biological relationship was not by any means close.

Having established the great differences in members of the coliform group, it follows that stock vaccines prepared from a single strain can in the majority of instances offer little hope of being specific. Further, having demonstrated the saprophytic nature of coliform organisms, it is evident that cure of bacilluria cannot mean the total disappearance

of the organisms from the urine, but that a cure is indicated by absence of pus cells and disappearance of symptoms.

A number of cases have been treated with autogenous **Vaccines.** In acute cases, a dose of 3 to 5 million is repeated in three to five days, subject to control by the clinical features, pyrexia, symptoms, increase of pus, etc., and especially by the opsonic index, which has proved of undeniable assistance. Unfortunately it has not always been feasible to apply this latter. It is to be remembered that an auto-inoculation of the patient is going on at the same time as the artificial inoculation, so that it often becomes very difficult to fix the dose, and what may be therapeutic one day may, as the result of this auto-inoculation, be toxic on another occasion. The doses in the more intractable cases were increased gradually up to 200 million, and the intervals of inoculation lengthened to eight days. In these cases the acute symptoms have usually cleared up rapidly, but the pyuria is apt to persist.

In chronic cases, the initial doses should range round 50 to 100 million, and be more or less regularly increased to 200, to 500, and even 1000 million. In most cases there is considerable improvement, which, however, does not always last, and the treatment may have to be continued for very long periods.

It has been shown (*page 17*) that alkalization of the urine does not hinder the action of **Urotropin** in such cases.

Reference.—[1] *Jour. Obst. and Gyn.* 1912, Aug.

BACILLUS COLI INFECTIONS. *Herbert French, M.D., F.R.C.P.*

The list of affections for which the *Bacillus coli communis* may be primarily responsible is now known to be a long one. The subject was discussed at considerable length recently before the Royal Society of Medicine of London, the opening paper being by H. D. Rolleston.[1] Apart from any obvious local lesions, there may be either acute or chronic general illness due to the *Bacillus coli communis*, the symptoms in the acutest form simulating those of any other kind of septicæmia, whilst the chronic effects may vary from what might be called simple continued ill-health, to so serious a malady as profound or fatal anæmia. Some claim that pernicious anæmia is not due to any single cause, and that it has as one of its important factors chronic infection by the *Bacillus coli communis*. As regards local affections due to this micro-organism, the list is already known to be a long one, including appendicitis, peritonitis, cholecystitis, cholelithiasis, enteritis, colitis, gastric ulcer, pancreatitis, diabetes, cystitis, pyelitis, pyelonephritis, epididymitis, prostatitis, urethritis simulating gonorrhœa, endometritis, catarrh of the cervix uteri, sigmoiditis, chronic ulcers of the legs, dermatitis, infective endocarditis, arthritis, meningitis, bronchopneumonia, and empyemata. A considerable number of references to other papers dealing with *B. coli* infections are given by Rolleston.

Treatment.—In these days of bacterial injections it is most important that proper bacteriological evidence of the causal con-

nection between the *B. coli* and a given lesion should be established before **Vaccine** treatment of the malady is undertaken. In the discussion which followed, J. W. Smith recorded an interesting case of chronic general dermatitis, with acute exacerbations which had recurred for three or four weeks at a time for several months, and which affected practically the whole of the surface of the skin. Toxæmia, probably of intestinal origin, was the view at first taken of the case, and the patient, a lady, was treated with intestinal antiseptics, including calomel and salol, but without success. The idea of *B. coli* infection then suggested itself, and the patient's urine was found to swarm with *B. coli* organisms. Further proof of this bacterium being the cause of the dermatitis was the beneficial effect of vaccine treatment. Injections were given every four days, and from this time steady improvement took place, no further relapse occurred, the patient got quite free from her skin trouble, and remained so.

Reference.—[1]*Brit. Med. Jour.* 1911, ii, 1186.

BALANTIDIUM COLI. *Leonard Rogers, M.D., F.R.C.P.*

Fred B. Bowman[1] deals with his experience of this parasite in the Philippine Islands. It is occasionally found in healthy people, and occurs in temperate as well as hot climates. In three cases studied by the writer the clinical symptoms resembled amœbic dysentery, beginning with mild intermittent diarrhœa and passing on to dysenteric symptoms, including passage of blood and mucus, with relapses and emaciation. The large and completely ciliated organism may sometimes swarm in the mucus. There is no leucocytosis, but the eosinophile leucocytes may be increased. The prognosis is bad even in early cases, while when dysenteric signs set in it is almost hopeless. The ulceration is nearly always limited to the colon and rectum ; the bowel is greatly thickened, the ulcers eventually having thickened undermined edges with congestion and sloughing, while perforation may occur. The parasites are found in all the layers, but mostly in the mucous coat. This infection also occurs naturally in monkeys, but attempts to infect these animals artificially, failed. [In view of the deadly nature of this infection, subcutaneous injections of **Emetine,** which are so effective in amœbic dysentery, are worthy of trial.—L. R.]

Reference.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1814.

BERI-BERI. *Leonard Rogers, M.D., F.R.C.P.*

Henry Fraser and A. T. Stanton[1] have published a full report on their experimental investigations into the relationship of decorticated or *polished white rice* to beri-beri. They proved that the deeper layers of the pericarp, which are removed by the polishing process, contain substances necessary for the physiological needs of the system, and that this substance is not phytin, but probably a protein soluble in 90% per cent alcohol. The estimation of the total phosphorus content in terms of phosphorus pentoxide may be used as an indicator of the amount of the necessary substance in any given rice. Parboiled rice

does not produce beri-beri, while by adding to decorticated rice the substances removed by polishing, beri-beri may be prevented, or cured after it has appeared. Freshly polished rice is as bad as stale samples, so the disease is not produced by any fungus or toxin, but is purely a nutritional defect.

H. Schaumann[2] has for long been working on similar lines. In a goat he succeeded in producing a chronic disease with paralysis, closely resembling human beri-beri. Phytin had no effect in preventing the nerve degeneration in fowls, while the active substance is too small in amount to allow of the disease being due to deficiency of either of the primary constituents of a physiological diet. The protective substances agree in containing much organic phosphorus compounds. Working at the chemical composition of the protecting rice bran, he prepared an alcoholic and a hydrochloric acid extract, both of which had remarkable powers of restoring even markedly paralyzed pigeons and dogs within a few hours. The appetites of the animals were also greatly stimulated. Similar results were obtained with substances extracted from yeast and *Phaseolus radiatus*. From the hydrochloric acid extract he isolated a crystallized substance, containing nitrogen but no phosphorus, which he is examining further. He considers the protecting substance is an "activator" which produces changes in any organic phosphorus compounds present. Beri-beri is therefore a disease due to a deficient metabolism of phosphorus and its compounds.

Axel Holst[3] has for long been working at "ship beri-beri." Until 1894, Norwegian crews on long voyages were supplied with rye-flour biscuits prepared with baker's yeast, on which pigeons may be fed without getting the neuritis first described by Eijkman. Since that time the sailors have been obliged to bake bread without yeast from wheat and rye flour, which, when given to pigeons, produces neuritis. Peas, which contain protective substances, have also been given less frequently to the men. As a result, beri-beri has several times occurred. He also discussed the relationship between ship beri-beri and scurvy, and thought both might be due to the same deficiency of diet.

E. A. Cooper and Casimir Funk[4] have worked at the chemistry of rice at the Lister Institute, with a view to isolating the protecting substance from rice bran (polishings). Experiments with an exclusive diet of pure carbohydrates showed that they produced polyneuritis, thus disproving any hypothesis of toxin being the cause. Casein and egg-yolk, which contain much organically combined phosphorus, do not protect. They confirmed the curative action of yeast, and found it was also active after being hydrolysed with 20 per cent sulphuric acid for twenty-four hours, which completely hydrolyses all organic phosphorus compounds, which may thus be excluded. From Fraser and Stanton's alcoholic extract they obtained a precipitate by means of phosphotungstic acid, which was extraordinarily active, curing very advanced paralysis in birds in from three to ten hours. This substance is present in very minute amounts in rice polishings and is not protein in nature, is devoid of phosphorus, soluble in water and

acidulated alcohol, dialysable and precipitated by phosphotungstic acid.

E. D. W. Greig[5] has published two reports on an investigation of the disease known as *epidemic dropsy*, in Calcutta, and has come to the following important conclusions concerning it. No pathogenic micro-organisms could be found in the blood, œdematous fluid, excreta, etc., of cases, while all the evidence pointed to its being non-infectious. The features of the disease cause it to resemble very closely those of " ship beri-beri." There is also evidence that the affection is due to " one-sided " dietary. A careful study of the racial distribution of the disease showed that an up-country community of Marwaris living in the heart of the affected portion of Calcutta, practically entirely escaped the disease, while no fatal case occurred among them. An analysis of their diet showed that it was much richer in some important constituents containing phosphorus than the rice diet on which the severely affected Bengalis so largely live. The better-class Europeans entirely escaped the disease, only a few cases among Eurasians, who feed very largely on rice, being reported by Megaw. Moreover, among the Bengalis the highest incidence and mortality were among the Hindu females who take less meat than the males, and particularly among their widows, who for religious reasons do not take meat at all and are pure rice feeders.

His observations also confirm those of Fraser and Stanton and of Schaumann, regarding the removal of phosphorus-containing substances in the pericarp during the process of polishing rice, and the production of the disease in fowls by polished rice alone. He also notes that the wheat, which is consumed largely by Bengalis in the form of ata, is in its preparation deprived of these ingredients to an even greater extent than rice. Either rice polishings, or certain peas, especially the Indian Mung dal (*Phaseolus radiatus*) will prevent and also cure the polyneuritis of birds. Lastly, he shows that the two severe outbreaks of epidemic dropsy in Calcutta, of 1877–79 and 1907–9, were correlated with a sustained high price of food grains, and their cessation coincided with a fall in price of food. Such high prices would tend to limit the diet of the poor even more exclusively to rice than is usually the case. These reports go far towards placing epidemic dropsy in the large group of dietetically-produced diseases.

A. F. G. Kerr[6] reports on an outbreak of beri-beri in northern Siam, in which unpolished rice only was consumed, and thinks it lends some support to the toxic or parasitic theory as against the purely dietetic one. H. Stott[7] deals with an outbreak of beri-beri in an Indian regiment at Madras, in which only the Mahommedans consuming polished rice suffered, while other races using parboiled rice escaped.

W. P. Chamberlain, H. D. Bloombergh, and E. D. Kilbourne,[8] have also carried out an extensive series of experiments on the effects of feeding fowls with various kinds of rice, etc., and have confirmed the earlier work of Fraser and others. They note that a few fowls which voluntarily eat heartily of polished rice do not develop neuritis, but

forcible feeding will not prevent it. The addition of certain inorganic salts of phosphorus and potassium to polished rice did not prevent the disease. Contrary to other observers, they found that starvation would sometimes produce polyneuritis if the birds lived for a sufficient time, a loss of 21 per cent of weight being necessary. They also observed the late development of spasticity in some fowls. The reduction of the potassium content of a rice is as good an index of its power of producing beri-beri as one of the phosphorus content.

Chamberlain and Vedder[9] further found that the substance in rice polishings which produced neuritis is soluble in cold water and in cold alcohol, and contains only one-thousandth part of the original phosphorus compounds. It is also dialysable, which excludes all colloids. The sucrose contained in the extract is of no importance, so the active substance is contained in the remaining 0·4 per cent of solid matter of rice polishings. An equally effective substance is present in ordinary white beans, which will prevent beri-beri. In a third memoir[10] the same writers show that certain nitrogenous compounds, including various amino-acids, do not prevent neuritis in fowls, and that the protective substance is insoluble in ether, but is absorbed by animal charcoal.

Vernon L. Andrews[11] deals with infantile beri-beri, to which he attributes the high infantile mortality in Manilla, and thinks it due to a deficiency in the mother's milk, which is lacking in something necessary for the growth and development of the child, and not to any infection or toxæmia. This furnishes another link in the chain of evidence that beri-beri is a nutritional disturbance. As a prophylactic measure he would compel dealers to stock the undermilled variety of rice, and would carry on a campaign to educate the poorer classes, and especially pregnant women, on the subject.

John M. Little[12] shows that beri-beri is frequently caused in Newfoundland and Labrador by too narrow limitation of the diet to fine white flour which has been freed from all the cortical parts of the grain, just as in the case of highly polished rice, and that it is preventable by giving whole-wheat flour instead.

G. C. Thomson and G. C. Simpson[13] have treated three lascars at Liverpool for beri-beri, with diets including **Katjangidjo Beans,** and with **Yeast:** the symptoms disappeared much more rapidly than with former methods.

References.—[1]*Jour. Trop. Med. & Hyg.* 1911, Nov. 333; [2]*Trans. Soc. Trop. Med. & Hyg.* 1911, 59; [3]*Ibid.* 76; [4]*Lancet*, 1911, ii, 1266; [5]*Sci. Mem. India*, Nos. 45, 49; [6]*Trans. Soc. Trop. Med. & Hyg.* 1911, 91; [7]*Jour. R.A.M.C.* 1911, ii, 231; [8]*Phil. Jour. of Sci.* Sect. B. 1911, vi, 177; *Ibid.* 151; [9]*Ibid.* 395; [10]*Ibid.* 1912, vii, 39; [11]*Ibid.* 67; [12]*Jour. Amer. Med. Assoc.* 1912, i, 2029; [13]*Ann. Trop. Med. & Parasit.* 1912, vi, 53.

BILHARZIASIS. *Leonard Rogers, M.D., F.R.C.P.*

H. B. Day[1] deals fully with the *blood-changes* in bilharziasis, based on his extensive experience in Egypt. In uncomplicated cases he finds a slight general leucocytosis with a marked increase of the

eosinophile cells at the expense of the polynuclears, the eosinophiles averaging 23·7 per cent, the changes being roughly proportional to the intensity of the disease. If secondary septic infection is present, the increase of the eosinophiles and the decrease of the polynuclears are less marked and may be completely obscured. A moderate secondary anæmia is present, a loss of hæmoglobin being found even when the red corpuscles are not reduced. Profound anæmia may result from the excessive loss of blood, prolonged suppuration, and chronic diarrhœa. Bilharziasis is the commonest worm infection in Egypt and causes most cases of moderate anæmia in children, but ankylostomiasis is a more frequent cause of severe anæmia, which is exaggerated by a combination of the two diseases, or of either with other diseases such as endemic cirrhosis of the liver.

The same writer[2] records his experience of salvarsan in bilharziasis, which had been reported by Ehrlich on the strength of observations by an Egyptian doctor to produce a rapid cure with cessation of escape of the ova of the parasite. Day shows that the cases on which this report was based were few, and not followed up long enough to exclude the common temporary disappearance of ova from the excretions. He has avoided this source of fallacy, and finds the drug absolutely inert in bilharziasis.

REFERENCES.—[1]*Lancet*, 1911, ii, 1328; [2]*Ibid.* 1912, i, 1126.

Herbert French, M.D., F.R.C.P.

Salvarsan has been advocated by some observers in the treatment of bilharziasis, and it is disappointing that the good results originally claimed for this treatment are not being confirmed; because hitherto we have possessed no medicinal means of hastening the eradication of bilharzia and its ova from the body. One of the most recent papers upon the subject is by Fulleborn and Werner.[1] The "606" was given intravenously in doses of 0·5 gram, but did not influence the clinical picture, and the authors could not confirm the observation of Joannides that the bilharzia eggs disappear from the urine a few days after the salvarsan injection.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 351.

BILIARY TRACT, SURGERY OF.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

McWilliams,[1] who has made a study of *perforations of the gall-bladder and bile-ducts*, says that the gravity of these cases depends upon the infective character of the condition leading to the perforation —ulceration, perforation by gangrene, etc. The perforation generally occurs in the gall-bladder, and is usually associated with gall-stones. The symptoms are those of a sudden right-sided peritonitis in the upper abdomen. **Drainage of the Gall-bladder** gives the best results. If bile is free in the abdomen, this should be washed out, and a drain placed above the pubes and also in the right kidney pouch.

Sullivan[2] has suggested a method of *reconstructing the common bile-duct* by means of a rubber tube. One end of the tube is inserted within the stump of the hepatic duct and fixed by an unabsorbable suture ; the other end is passed into the duodenum, preferably through the stump of the common duct, but if this is not available it is inserted for about half an inch through a small incision in the wall of the duodenum, and secured there by unabsorbable sutures. The duodenal walls are sutured over the tube for a short distance after the fashion of a Witzel's gastrostomy. The omentum is then brought up and fixed around the rubber tube with sutures.

This operation has been successfully performed upon animals. The tube eventually becomes loose and passes into the duodenum. The resulting omental tube forms the basis of a new duct, which after a time becomes lined with epithelium. A similar operation has been performed on human beings by Wilms,[3] who records five cases in which, on account of obstruction of the common duct by tumour, adhesions, etc., a rubber drainage tube was implanted to carry the bile from the hepatic duct to the duodenum (in one case the end of the tube was inserted into the stomach). This method does not take long to carry out, and may therefore be useful in debilitated patients. Wilms recommends that the end of the tube should be led obliquely into the duodenum. The tube appears capable of functioning for some months ; in one case a year has elapsed since the operation.

Primary **Closure of the Abdominal Wound without Drainage, after Cholecystectomy** is advocated by Rotter,[4] in uncomplicated cases. His experiences in the treatment of acute appendicitis with suture of the wound led him to adopt this method after removing the gall-bladder.

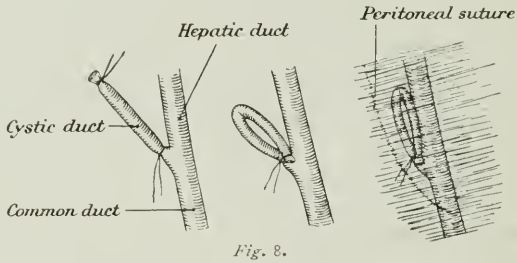


Fig. 8.

It is necessary that all raw surfaces be first covered with peritoneum, that no necrotic or pus-infiltrated area be left behind, and that hæmostasis be made complete. These conditions may be fulfilled if the gall-bladder is removed by the subserous method, and its bed covered by suturing the peritoneum across it. The cystic duct is freed up to its junction with the hepatic duct, is tied in two places a short distance apart, and then folded over so as to kink its lumen between the ligatures (*Fig.* 8). The peritoneum is then sutured over the stump. If the operation has been carried through aseptically, the wound is completely closed in layers. If there has been any possibility of

infection, the peritoneum only is completely sutured, the superficial part of the wound being drained. Rotter has by this method obtained primary healing in the majority of his cases of uncomplicated cholecystectomy.

Volvulus of the Gall-bladder.—Having met with an example of this condition in the post-mortem room, Kubig[5] was led to examine the literature, and found records of three others. All four cases occurred in persons of somewhat advanced age. The gall-bladder was twisted from one to two complete turns in a clockwise direction. It was distended, forming a kidney-shaped tumour with thick walls, generally contained blood, and in only one case were there calculi within it. The symptoms were pain in the right side of the abdomen, and vomiting. The abdomen was distended, and a tender mass could be felt below the costal margin. The one point that may permit of a diagnosis is the recognition of a palpable kidney-shaped mass lying transversely below the edge of the ribs.

Two cases of *carcinoma of the ampulla of Vater* are recorded by Upcott,[6] who gives a brief survey of the literature. These tumours are generally slowly-growing adenocarcinomata, occasionally giving rise to metastatic deposits in the liver. Obstruction of the pancreatic and common bile-ducts is produced early, leading to profound jaundice and rapid loss of weight.

Treatment may be **Palliative** (cholecystenterostomy) or **Radical** (excision of the tumour). Owing to the slow growth of the tumour, palliative operation may lead to a considerable prolongation of life. Upcott gives a summary of the sixteen recorded cases of excision of tumours of the ampulla, including one of his own. In thirteen cases the ampulla was excised by the transduodenal route, with eight recoveries and five deaths. In three cases a segment of the duodenum was resected, with two recoveries and one death.

References.—[1]*Ann. Surg.* 1912, i, 235; [2]*Jour. Amer. Med. Assoc.* 1912, i, 2026; [3]*Berl. klin. Woch.* 1912, 536; [4]*Ibid.* 1551 and 1649; [5]*Münch. med. Woch.* 1912, 1999; [6]*Ann. Surg.* 1912, ii, 711.

BLACKWATER FEVER. *Leonard Rogers, M.D., F.R.C.P.*

L. G. Fink[1] deals with blackwater fever in Burma. The disease has been met with in the northern parts, including Bhamo and Ruby Mines districts, i.e., in the same latitude as the Duars and Assam, where the disease also prevails. He agrees that it is a complication of malarial fever. He had obtained a great reduction of malaria among sepoys by the use of mosquito curtains and quinine prophylaxis.

Warrington Yorke[2] discusses the mechanism of production of urinary suppression in blackwater fever. In order to determine if this serious symptom is due to a nervous inhibition of glomerular secretion, as A. Plehn maintains, or to a mechanical blocking of the tubes by granular material derived from the dissolved hæmoglobin, he has carried out some experiments. Simple injection of hæmoglobin

dissolved in salt solution produced only diuresis. By first inducing anæmia by a moderate bleeding, so as to reduce the blood-pressure, and then injecting a strong watery solution of hæmoglobin intravenously, suppression of urine was produced in a number of animals. Epithelial casts, some containing granular material, were passed. Usually the condition gradually cleared up, but complete anuria and death occasionally resulted. The kidneys soon became of a dark-chocolate colour, with brownish-coloured plugs in the convoluted tubules. After several injections of hæmoglobin, the cortex was enlarged, and showed dark striæ, due to the convoluted and Henle's tubes being filled with granular material and epithelial and granular casts. In fatal cases the tubules of the cortex were greatly dilated, and showed numerous casts and extensive epithelial degeneration. Thus the first effect of the injections is a diuresis due to the sodium chloride in which the hæmoglobin was dissolved. Next, a deposit occurs in the tubules, epithelial cells are shed, blocking of the tubes occurs, first complete in the narrow tubules of Henle, and the urine becomes diminished in amount, loaded with albumin, and very turbid, the centrifuge sometimes bringing down a deposit equal to one-fourth of the volume. Ultimately the portions of the tubes above the block become distended by the secretion, and their walls thinned. Any lowering of the blood-pressure greatly favours the process, but if the volume of the blood is maintained by injections of saline solution and much moist food, a large amount of hæmoglobin may be safely injected.

Treatment.—Therefore, immediately any diminution of the volume of urine occurs, large quantities of **Fluid** should be given by the mouth and rectum, and **Cardiac Stimulants,** such as digitalis and caffeine, administered. If these do not result in a copious flow of urine, large intravenous **Normal Saline Injections** should be given. It is essential to adopt these measures before actual suppression has set in, when they are usually too late to undo the fatal blocking of the tubules.

References.—[1]*Ind. Med. Gaz.* 1912, 107 ; [2]*Brit. Med. Jour.* 1911, ii, 1272.

BLADDER. *J. W. Thomson Walker, M.B., F.R.C.S.*

The Röntgen diagnosis of *calculus of the bladder* is the subject of an article by Thurstan Holland,[1] who has never, either in his own experience or in that of his friends, heard of or seen a pure uric acid stone which has been removed surgically from a kidney or ureter. In the bladder, pure uric acid stones are rare, but do sometimes occur, and this being the case a negative opinion as to the presence of stone in the bladder cannot be given from an *x*-ray examination alone. He has seen two cases of multiple pure uric acid stones in the bladder, and in neither could their presence be demonstrated by the *x*-rays.

Although a shadow may be shown by the *x*-rays, it is not easy to be sure of the exact position of the body throwing the shadow. The

author is flogging a dead dog when he says, " I would suggest that at the present time, the routine sounding of the bladder for stone is obsolete and should be entirely given up," and, " Cystoscopy of course has the same objections—namely, the inconvenience of the patient, and the danger. It may, moreover, be useless on account of bleeding from the bladder, or from pus, obscuring the vision."

Radiography, he holds, is the first method of examination in all cases of suspected calculus of the bladder. He admits, however, that it cannot be entirely relied upon as far as the negative evidence is concerned, as it fails to reveal the pure uric acid stones; it does not show whether a stone is encysted or not; it cannot always tell whether the stone is actually in the bladder or in the lower end of the ureter; or demonstrate the exact number of stones.

[Radiography and cystoscopy are supplementary, not antagonistic, methods of diagnosis. To cystoscopy the whole field of diagnosis of bladder disease is open; by radiography only stone can be detected, and its application here is limited. The presence of a shadow does not prove that the stone is in the bladder, and the absence of a shadow does not prove that a stone is not present. I have been saved from grave operative errors by insisting on cystoscopy when a patient presented an *x*-ray print showing a shadow in the bladder area in the following cases: (1) Stone in a diverticulum; (2) Stone at the vesical end of the ureter; (3) Stone combined with growth of the bladder.—J. W. T. W.]

Jacobson and Keller[2] conclude that *cystitis following surgical operations* is not always due to catheterization. For the production of cystitis it is necessary to have a bacterial infection plus retention, trauma, or congestion. The colon bacillus is the organism most frequently found in post-operative cases. According to Barisch the reason of the presence of the colon bacillus in the vestibule and lower part of the urethra in women, is the proximity of the rectum in bed-ridden patients.

Post-operative urinary retention may be due to a variety of causes. The following theories are advanced to explain it: the recumbent posture; neurosis; reflex urethral spasm and bladder paralysis; disturbances of intra-abdominal pressure; paralysis and atony of the detrusor muscle from toxic substances, as in post-operative atony of the intestine; trauma of the peritoneal covering of the bladder; interference with the blood- and nerve-supply of the organ; and swelling or œdema of mucous membrane at the internal meatus.

Trauma and congestion as predisposing factors to cystitis occur in all operations in which a separation of the bladder from its attachments is necessary. Cystoscopic examination after such operations often reveals malposition of the base, distortion of the trigone, and displacement of the ureteral orifices. Whenever extensive dissection or separation of the bladder is a part of the operation, an accurate reposition and covering of its raw surfaces with peritoneum are necessary. The authors recommend urethral injection of a solution of 2 per cent boric

acid in sterile glycerin in all cases of post-operative retention, before resorting to catheterization.

Leutscher[3] contributes an article on *infection of the urinary tract* by *B. lactis aerogenes*, with a consideration of the mode of entrance of bacteria into the bladder. In the literature are found bacilli termed *B. septicus vesicæ*, *B. pyogenes*, *Cocco-bacillus ureæ*, *B. lactis aerogenes*, and *B. coli communis*, which possess the same cultural characteristics, morphology, and active mobility, and cause cystitis in 71 per cent of cases. These cultures are now known not to be *B. lactis aerogenes*, as they were actively motile, and occurred in 70 per cent of the cases of cystitis, which closely corresponds to the percentage of cases of *B. coli* cystitis found by all later observers. A few cases of undoubted infection with *B. lactis aerogenes* do however occur.

In discussing the mode of entrance of bacteria into the bladder, the author says it is usually assumed that when there is no history of catheterization, the infection must be an endogenous or a descending one. Against this view is the greater frequency of spontaneous cystitis in women than in men. He summarizes various statistics thus : In 192 men with cystitis or pyelitis, only 10 per cent were without explanation as to the mode of infection ; while in 129 women there were 62 per cent.

The difference between the sexes is referred to the " short " and " often relaxed " female urethra. On examination of the normal female urethra, " the colon bacillus has been found by all observers in from 12 to 66 per cent of cases," and recently Alsberg has found the *B. coli* in 100 per cent of the cases he examined. (*See also* BACILLURIA.) *Staphylococcus albus* and *aureus* have been found in from 14 to 90 per cent. In the male urethra the *Gonococcus* easily invades the urethra and bladder, and in non-gonococcal urethritis streptococci, staphylococci, or diplococci and *B. coli* have been found.

Albeck has shown that of 150 non-pregnant women, 13·3 per cent had bacteriuria, due in 70 per cent of these to *B. coli*. In thirteen cases of bacteriuria the ureters were catheterized, and the urine was found clear and sterile in eight.

Barry[4] describes four cases of *automatic distension of the bladder with air in women*. Three of the patients were Europeans and one was a native. In two there was acute colicky pain whenever the bladder got greatly distended with air ; in one there was considerable inconvenience, while in the native patient there was very little trouble. One case may be quoted as illustrative of the condition.

A woman, aged thirty-four, the mother of two children, had suffered from colitis and cervical endometritis, and was in poor health, with soft flabby muscular tissues. She suffered for three weeks from cramp-like pains in the epigastrium, relieved by the passage of air by the urethra. It could usually be expelled by muscular effort or with the urine, but the bladder became more and more distended and was felt above the pubes distended and tympanitic. The orifice of the urethra was somewhat patulous. A catheter passed easily, and a

large quantity of odourless air under considerable pressure escaped. For some days the air was drawn off thrice daily. The urine was passed normally but with some air. It was normal and in average quantity. The condition disappeared under **Ergot** and **Strychnine.**

In all the cases the muscular system had lost tone, and Barry believes that the air was aspirated into the bladder by the abdominal respiratory movements in a manner somewhat analogous to that in which the rectum or vagina can be ballooned by elevating the pelvis.

Cystitis.—Etiology.—The organisms which invade the bladder may be divided into two classes: those which induce decomposition of the organic constituents of the urine, and those which cause little or no change in these substances (Newman[5]). Microbes may fail to give rise to cystitis unless they have the power of decomposing urea. Tubercle bacilli, *B. coli*, and pneumococci may be found in the urine without any lesion of the urinary tract. (*See also* Bacilluria, *and* Bacillus Coli Infections.)

The two most frequent sources of infection are from the intestine, and through the urethra. The modes of infection are: (1) Ascending, along the urethra, especially in women; (2) Descending or hæmatogenous, the microbes being conveyed by the blood and excreted by the kidney (tuberculous, typhoid, and *B. coli* infections); (3) Transparietal, through the lymphatics from the intestine to the bladder, as in appendicitis, dysentery, and internal hæmorrhoids.

The urine is acid or alkaline, according to the nature of the infection. If the organism be one decomposing urea (*Staphylococcus pyogenes, aureus*, or *albus*, *Gonococcus*, and mixed infections), the urine is alkaline; but if the bacteria do not decompose urea (*B. coli*, tubercle bacillus, *Streptococcus pyogenes*, *Pneumococcus*), it remains acid.

Treatment.—(1) *Mild B. coli Infection.*—To lessen the vesical irritation, large quantities of fluid should be taken, such as **Barley Water, Flax Seed Tea,** and drinks containing **Acetate** and **Citrate of Potash.** To allay pain, the hips should be raised on a hard pillow, so as to reduce pressure on the bladder, and the rectum kept empty by laxatives. **Phenacetin** and **Extract of Hyoscyamus** may be given internally in 5-gr. doses. If vesical tenesmus is present, a rectal injection of two teaspoonfuls of **Starch** containing **Antipyrin** and **Laudanum** may be given.

Urinary antiseptics should not be administered until the inflammation is declining, as they are irritating in the acute stage. **Boric Acid** is most useful when the inflammation is limited to the bladder, but when the kidneys also are involved it upsets the digestion. The bladder may be thoroughly washed with **Boric Acid Solution,** one-quarter strength. The bladder should be fully but not over-distended four times at each washing, and this should be repeated every second day. In chronic cases, careful instillations of **Nitrate of Silver** may be used (gr. 1 to 2 to the oz.) after washing the bladder with sterile water and emptying it.

(2) In *Acute Cystitis* the patient is confined to bed on limited plain diet, **Phenacetin** and **Hyoscyamus** are given, and the bowels freely

opened. The urine should be kept as nearly neutral and as dilute as possible. A **Vaccine** of the organisms should be prepared, and administered as soon as possible. " Vaccines are of special value in acute cases, and should be used at once." Estimations of the opsonic index are unnecessary.

Local treatment consists in washing the bladder at first with **Warm Sterilized Water** and later with **Permanganate of Potassium** (1–2000), **Protargol** or **Argyrol** (3 to 5 per cent), or **Boroglyceride** (5 per cent). In recovery from acute cystitis, instillations of weak solutions of **Nitrate of Silver** are the best, gr. $\frac{1}{10}$ to the oz.; later, **Oxycyanide of Mercury** in weak solutions (1–4000) are of great value. Acute cystitis occurring in the course of a chronic affection of the bladder, or in a weak elderly person, arising from any cause, but especially when there is urinary obstruction, should be treated by **Suprapubic Cystotomy.** Chronic cystitis is generally associated with incomplete evacuation of the bladder, so that the first essential points are to see that its contents are emptied at regular intervals, and that the source of obstruction is removed. **Saline** and **Sulphur Baths** are useful, and the administration of infusions of **Uva Ursi, Pareira Brava,** or **Triticum Repens,** in doses of 8 oz. three times daily, is advisable. **Boric Acid** and **Helmitol,** or a combination of **Boric Acid** and **Benzoate of Soda,** are the best drugs.

For details as to action of **Urotropin** in presence of alkaline urine *see page* 17.

(3) In uncomplicated *Chronic Cystitis,* due to an organism which does not decompose urea, regular **Irrigation** should be added to withdrawal of residual urine. When the cystitis is due to organisms which decompose urea, the carbonate of ammonia formed renders the urine very irritating and offensive, so that active local treatment is badly tolerated. **Permanganate of Potash** in weak solutions is the best agent. When the urine is alkaline, after irrigation an instillation of pure **Lactic Bacillus Cultures** in milk whey, or the filtrate of **Sauerine** may be employed with great advantage. If the cystitis improves, **Boric Acid, Acetate of Lead** (1–2000), or **Nitrate of Silver** (gr. $\frac{1}{2}$ to the oz.), may be used.

Parker Syms[6] advocates the use of the **Transperitoneal Operation** on the bladder, as introduced by Harrington, in tumours, certain cases of enlarged prostate, stones too large or unsuitable for crushing, and cases of stone at or near the ureteral orifices. This writer has " always found and thought that suprapubic cystotomy was a very unsatisfactory operation." He bases his view on " theoretical reasoning " and on the unfortunate results he has seen in the work of others. The disadvantages said to attend the suprapubic operation are: poor exposure, and infection of the cellular space of Retzius, with difficulty in draining it. Transperitoneal cystotomy is, according to this author, an ideal operation. " It should always be safe as far as infection is concerned."

[The exposure obtained by a properly performed suprapubic

cystotomy amply suffices for the most extensive and delicate work required within the bladder. The danger of infecting the cellular space does not exist with proper drainage, and the difficulty of draining is purely mythical. The universal immunity of the peritoneum from infection, where the urine is infected, is not as certain as the advocates of this operation so confidently state.—J. W. T. W.]

Lerche[7] describes a case of operation on a *diverticulum of the bladder*, and reviews the literature on the subject. In the author's case the diagnosis was made by cystoscopy, and a radiograph taken after introducing 400 c.c. of a 5 per cent collargol solution into the bladder. With the patient flat on his back the plate did not show anything abnormal, but with the patient turned about 35 degrees, the diverticulum was well shown. In order to facilitate the removal of the

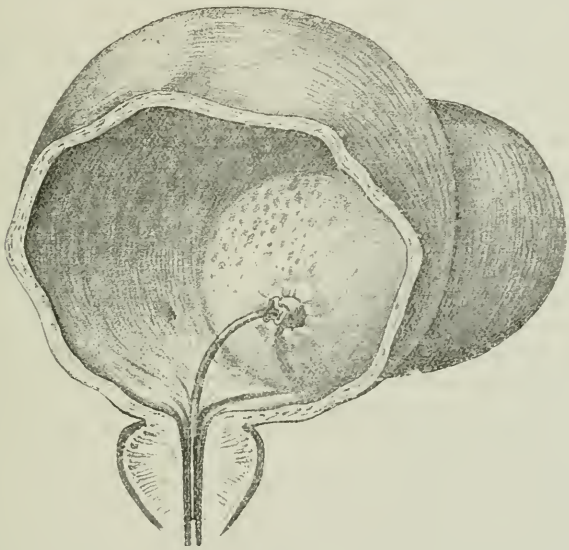


Fig. 9.—Diverticulum distended by inflated rubber bag.

diverticulum, a device was resorted to by which it could be distended while the bladder was partly collapsed. A small rubber bag was fastened to the end of a urethral catheter and wrapped around it, a tiny rubber band being slipped over to keep the bag rolled. When this bag is distended (*Fig.* 9), the rubber band is forced off and passed by the urethra later. The rubber bag wrapped around the catheter is introduced into the diverticulum, and boracic acid solution injected through the catheter into the sac until there is resistance. The corresponding amount of fluid is drawn off from the bladder. Dissection of the diverticulum, which was adherent to the peritoneum and rectum and extended into the hollow of the sacrum and beneath the trigone, was facilitated by the distended rubber bag. The diver-

ticulum was removed, the left ureter which lay in its wall was implanted in the vesical wall, and the opening in the bladder closed. The wall of the diverticulum contained muscle fibres.

The author concludes that both those which have muscle in the wall and those consisting of mucosa only, may form before birth and may also develop later in life. In either case they are formed, he believes, in consequence of some obstacle to the outflow of urine. A diverticulum may produce no symptoms, and there is no symptom pathognomonic of the disorder, the most characteristic being that the patient, after micturition, feels as if the bladder had not been completely emptied and is able immediately after to void a considerable quantity of urine. Pain and hæmaturia may be observed. Infection of the contents leads to intractable cystitis. The diagnosis is made by discovering a large quantity of residual urine in the bladder, by the cystoscope and radiography.

Chute[8] relates two cases of diverticulum treated by operation. In the second case, excision had to be abandoned owing to the extent of the diverticulum and the enfeebled state of the patient. These diverticula take origin, he believes, in small congenital pits which lie outside the ureteric orifices in either sex. In addition to this, some obstruction to the outflow of urine from the bladder is necessary, or even a severe cystitis with vesical tenesmus may be sufficient. With increase in size of the diverticulum, the opening of the ureter becomes dragged into it, and obstruction, with ascending infection of the kidney, is likely to follow. On this account it is important to recognize these diverticula early, and remove them before the ureter is affected.

A case of *polyp of the bladder* in a child aged thirteen months, is recorded by Koll.[9] The only symptom was complete retention of urine, and the tumour was not seen on cystoscopy. It was discovered and removed by suprapubic cystotomy, and was the size of a small hazel-nut, lobulated, and attached by a pedicle to the posterior lip of the internal meatus.

(An electrical method, styled "**Desiccation,**" has been used in treating papillomata of the bladder).

Pilcher[10] gives the details of an intraperitoneal operation for extensive *carcinoma of the bladder*, with a new method of treating the divided ureter. The growth involved the left ureteric orifice, the left wall of the bladder, a portion of the trigone, some of the anterior wall, and an area extending around the urethral orifice. In removing this mass the ureter was loosened from its sheath within the bladder wall and could easily be pulled down through the latter. "It occurred to me that a great deal of time would be saved and danger avoided if, instead of transplanting the ureter, the ureter should be cut across *in situ*, about an inch from its ostium, and simply allowed to slip back into place. This was done, the lumen cut across, and the end split up about $\frac{1}{4}$ in. to avoid narrowing the outlet by cicatricial contraction."

[This operation is not new. Two cases, those of Albarran and the writer,[11] are on record, in which the ureter was cut across and abandoned

in the pelvis, a large drainage tube leading to the ureter being introduced through an opening in the bladder wall. In the latter case a cystoscopic drawing was made three months later of the funnel-like ureteric orifice which resulted.—J. W. T. W.]

References.—[1]*Liverp. Med.-Chir. Jour.* 1912, 324; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1980; [3]*Johns Hop. Hosp. Bull.* 1911, 361; [4]*Ind. Med. Gaz.* 1912, 14; [5]*Lancet*, 1912, i, 490, 570; [6]*Amer. Med.* 1912, i, 88; [7]*Ann. Surg.* 1912, i, 285; [8]*Bost. Med. and Surg. Jour.* 1912, ii, 316; [9]*Ann. Surg.* 1911, ii, 589; [10]*Ibid.* 593; [11]*Proc. Roy. Soc. Med.* 1910, Jan.; and *Congr. Intern. d'Urol.* 1911, London.

BLASTOMYCOSIS. *E. Graham Little, M.D., F.R.C.P.*

Shepherd and Rhea report a fatal case of this rare disease from Montreal in a man aged twenty-five, who had been thought to be the subject of tuberculosis. The identification of the special organism was made post mortem in every organ except the brain. Iodide of potassium, usually so beneficial in this disease, proved unavailing even in large doses (gr. 40 three times daily). The clinical symptoms included a number of disseminated abscesses and ulcerated areas from which the organism was cultivated, and pleurisy without effusion, accompanied by raised temperature (102°), with profuse sputum in which the organism could not be shown. The patient became emaciated, and died nine months after the onset of the disease.

BLOOD, EXAMINATION OF. *Oskar C. Gruner, M.D.*

Blood Platelets.—Brockbank's[1] observations show that the platelets are scanty or numerous almost at will, although he comments on the fact that they are much more easily obtained in blood from secondary anæmias. This explains Bunting's[2] finding that they are frequent after hæmorrhage; the variation of 500,000 between the "normal" platelet-counts of such authors as Pratt, Wright, Muir, Affanasiew, Kemp, Brodie, and Russell; and the observations that platelets are increased during menstruation and later on in the puerperium, while in infants and conditions other than labour and puerperium in the female, absolutely irregular results are obtained.

Brockbank's observations upon the *origin* of the platelets consist in noting their close connection with the red cell, which is often seen to be burst or "eviscerated"; sometimes more than one will emerge from one cell. There is never any connection between them and the leucocytes. Wherever the anæmia is secondary, they are very frequently and easily obtained, but in pernicious anæmia it is difficult to see any. Some (sometimes all) red cells, then, extrude blood-platelets when they come in contact with the air. Possibly the anæmic corpuscles burst more readily than the hyperchromic ("pachydermic") corpuscles of pernicious anæmia. Brockbank suggests that the blood-platelet material is a regeneration product, and represents "potential hæmoglobin"—some protein constituent ready to unite with hæmatin. In this connection one may refer to Schilling's[3] investigations, which go to prove that the platelet is really

a part of the original nuclear matter, so that the red cell—everywhere for many years glibly spoken of as non-nucleate—is really a true cell with the nuclear matter reduced to a very small bulk—not visible through the deeply-coloured hæmoglobin, but extruded with the platelet when the blood leaves the vessels.

The observation that the platelets *are more numerous in the same blood if the preparation is made after thirty seconds, than when made at the moment of puncture*, is sufficient to completely refute the idea that they come from the megacaryocytes of the bone-marrow.

Duke[4] studied the platelets in hæmorrhagic diseases, and found that toxins cause variable effects on the numbers of platelets, small doses increasing, large ones diminishing them. These findings are associated with variations in the coagulation-time. Prolonged coagulation-time was associated with diminution of the platelets.

Blood-Cell Counting.—A practical suggestion for making a *differential and a total leucocyte count at the same time* comes from David Thomson,[5] who devised the method in order to enumerate malarial parasites easily. The requirements are a special pipette (obtainable from C. Baker, 244, High Holborn, London, W.C., at 10s. 6d.), an ordinary microscopic slide, and Jenner or Leishman stain.

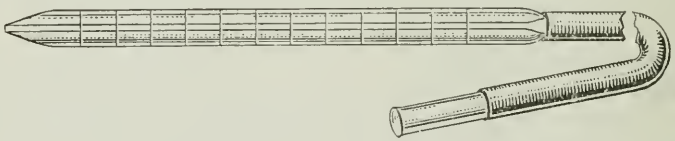


Fig. 10.—Thomson's Leucocytometer.

Prick the ear, allow a tiny drop of blood to exude, suck into the pipette, expel till the column coincides with any of the graduations of the pipette (*Fig.* 10); then expel (up to the next graduation) on a clean glass slide; immediately expel the residue [and suck up a little nitric acid.—O. G.] Breathe on to the slide and carefully spread out the drop of blood into a 4 mm. square. Allow to dry. Stain (if desired, fix in acetic-acid alcohol first, to dehæmoglobinize). Clean out the pipette and put away.

Put a piece of paper with a square hole in it into the microscope eye-piece. Use a mechanical stage and the oil immersion. Find the upper margin, and work down to the lower margin. Count every fifth horizontal line. The average total in each line, multiplied by the number of fields' depth of the total film, multiplied by the volume of each graduation on the pipette, gives the total per c.mm. Thus, if the average number was 40, the number of fields 30, then the total of the whites in the whole film is 1200. If each graduation was one-eighth of a c.mm., 1200 times 8 (9600) was the total for each c.mm.

The *error* of the pipette is 5 per cent. The error of the counting depends on the number of bands counted. The chief *advantages* are that (1) No diluting fluid or special slide is required; (2) The slides can

be stored for future use; (3) The differential count can be taken at the same time; (4) Auto-agglutination of the red cells can be seen in the pipette.

Another method for performing the *total and differential white-cell count* at one operation has been brought forward by R. A. P. Hill.[6] The requirements are a 1–10 pipette, the counting-chamber, and a small graduated tube like the hæmoglobinometer tube (Haldane). Dilute the blood with the following—distilled water 12, acetone 3, methyl alcohol 1, Wright stain (filtered) 4 parts. Making a 1–100 dilution gives eighty cells in a big square, which is enough for the total count. Count three or four big squares for the differential. If there is leukopenia, use a 1–10 dilution. Shake well to avoid froth forming in the diluting pipette. Mix, and transfer to chamber, and cover up quickly (the acetone is very volatile).

A series of blood-counts made by Bunting[7] in order to ascertain the *normal values for the differential count* revealed considerable differences from the average commonly accepted. Average total white-cell count = 7500. The average differential count = neutrophiles 54·6, eosinophiles 3·2, basophiles 0·8, small mononuclears 33·1. He suggests that this may be the normal finding in adolescents, since his normal cases were of that type, or that the local climatic and other conditions (Wisconsin) may be responsible.

Investigation of certain diseases by studying the *daily variations of the leucocytes* has been advocated by Thomson,[8] who found a marked diurnal fluctuation (from 5 to 125 thousand) in malarial cases. This occurred even in afebrile cases, and the leucocytosis was evident, even though the numbers of parasites in the blood were small. Similar fluctuations were noted in Hodgkin's disease and in a case of pyloric cancer.

The method of counting polynuclear leucocytes by *Arneth's method* has been followed for the *eosinophiles* also (Hultgen[9]), and some important facts have been brought to light. It has been found that the ordinary or common form of eosinophile leucocyte has a bilobed nucleus. However numerous these cells may be, the relative proportions of bilobed to other nucleate forms remains almost absolutely constant. In other words, the bilobate-nucleate cell is not evidence of increasing age. A large number of counts made by Hultgen further go to show that the mononuclear eosinophiles are not only rare but are evidence of degeneration. The third point of interest is that the cell-counts referred to afford decided evidence against Ehrlich's view that the eosinophile leucocyte passes through a myelocyte stage. The fourth point is that the Arneth method will not apply to the study of eosinophiles, and has no biological foundation.

Schomberg and Strickler,[10] examining a large number of cases of *scabies*, found that *eosinophilia* is quite frequent (80 per cent show at least 5 per cent eosinophiles). No conclusion is arrived at as to the explanation of this.

A case of *asthma* in which the eosinophiles reached 72·5 per cent of

the white cells was recorded by Herrick.[11] Three months later they had fallen to 7 per cent, the general condition of the patient being now very good. This finding was opposite to the general one, since the eosinophilia was most marked at the height of the asthmatic period.

A careful study by Margaret Reed Lewis[12] showed that the number of leucocytes in incipient *tuberculosis* averaged about 10,000 ; moribund cases showed over 25,000. The percentage of neutrophiles varies from 64·4 in incipient cases to 78·5 in dying cases. The large mononuclears are constant. The early cases showed about 10 per cent small lymphocytes, the advanced cases about 5 per cent. The eosinophiles decrease with the progress of the disease until they finally disappear. The far-advanced cases showed a neutrophile index of 75·25. Where the lobulation of the nucleus was very marked there was usually purulent infection as well. The number of lymphocytes forms a guide as to whether resolution in pneumonia or tubercle is good or not.

Characteristic changes in the blood-count have been found by Bunting[13] in *Hodgkin's disease*. This author claims to have found megacaryocyte pseudopodia in the blood films of these cases to a degree sufficient to render such finding very suggestive. A marked increase of platelets is very characteristic. Further, a marked increase of the transitional cells is noted. The percentage is high even though the total count be not much altered, and is still high when the leucocytes are much increased. The lymphocytes show no special change. The neutrophiles increase if there is periglandular inflammation or infiltration. The eosinophiles are diminished during the active progress of the disease, and increased in quiescent cases.

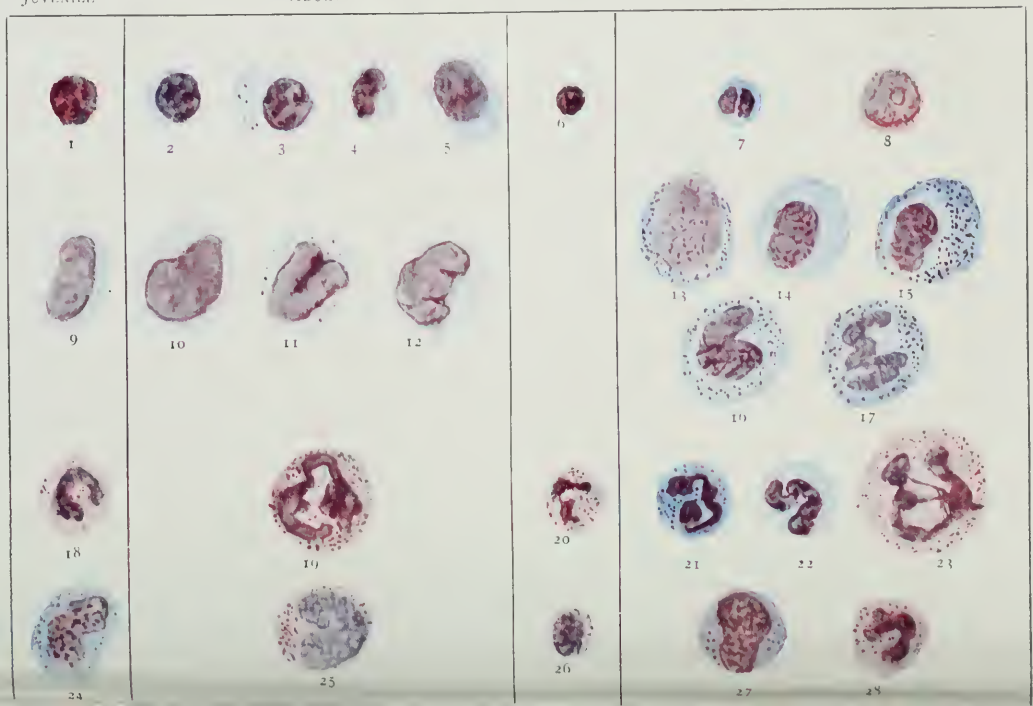
Leonard Rogers[14] found that *leucocytosis* of a peculiar type occurs in cases of *cirrhosis of the liver*. About 93 per cent of the cells are polynuclears, especially if the case is going to end in cholæmia. This writer considers that it is an intestinal infection and not alcoholism that accounts for hobnail liver.

Mononuclear Leucocytes.—The differential blood-count has become endowed with more value since Arneth gave the impetus to further research by his system of classifying the polynuclear leucocytes. Some of the criticism of his work was referred to in the MEDICAL ANNUAL for 1912, and the conclusion still remains that whatever be the theoretical faults of the method, the practical bearing is considerable. The advantages accruing from his advocacy of greater detail as to the neutrophiles, may also be expected if applied to the mononuclear cells.

It is a conspicuous fact that in the great majority of present-day case reports, a distinction between " small lymphocytes," " large lymphocytes," and " hyaline " cells is regarded as an adequate classification of the mononuclear cells. It is nevertheless advisable to study these cells by more refined methods.[15] The blood-films should be stained by *Pappenheim's panoptic stain* as follows : Treat the dried film with Jenner's solution for three minutes by the clock. Cover with a Petri dish immediately. Add an equal volume of distilled

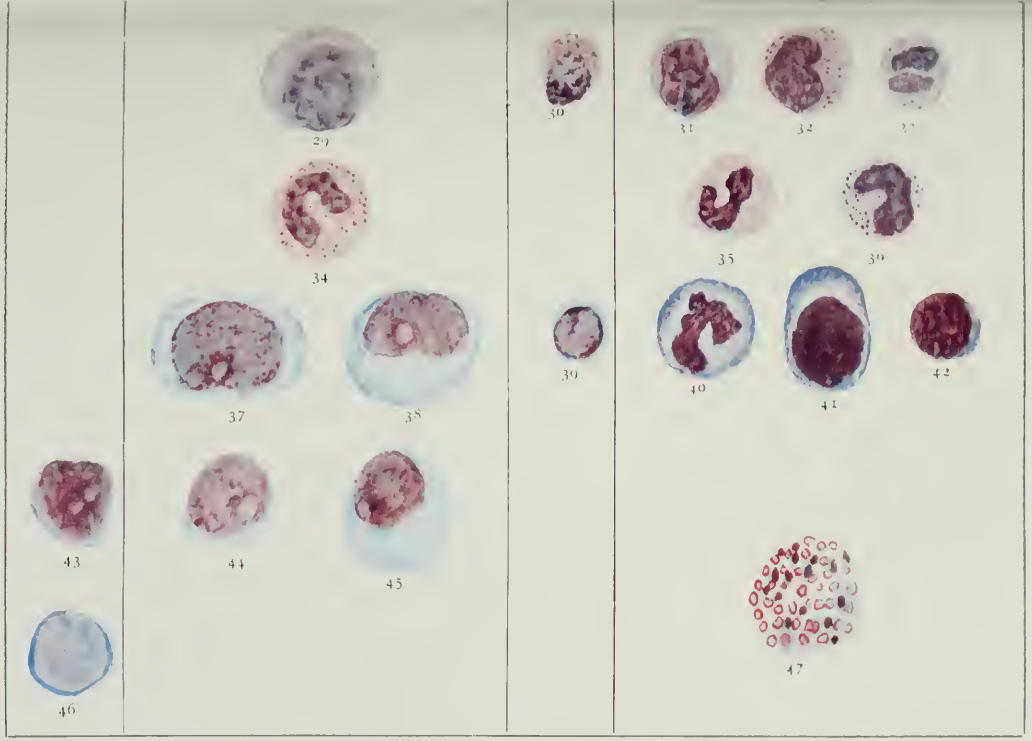
PLATE VI.

MONONUCLEAR BLOOD-CELLS



EXPLANATION OF PLATE.

1. Lymphocyte with minimal cyto plasm
2. Normal lymphocyte
3. Leucocytoid lymphocyte
4. Lymphocyte with reinform nucleus
5. Mesolymphocyte
6. Dwarf lymphocyte
7. Lymphocyte showing mitosis
8. Myelolymphocyte
9. Juvenile large mononuclear
10. Normal monocyte
11. Transitional cell
12. Leucocytoid large mononuclear
13. Leucoblastic monocyte
14. Myeloic monocyte without azure granules
15. Leucocytoid myeloic monocyte
16. Myeloic monocyte with indented nucleus
17. Polynuclear leucoblast
18. Metamyelocyte
19. Normal polynuclear leucocyte
20. Dwarf polynuclear leucocyte
21. Basophile polynuclear (granular neutrophile leucocyte
22. Non-granular polynuclear neutrophile leucocyte



23. Giant leucocyte
24. Leucoblast
25. Promyelocyte
26. Dwarf promyelocyte
27. Basophile promyelocyte
28. Polynuclear promyelocyte
29. Myelocyte
30. Dwarf myelocyte
31. Non-granular myelocyte
32. Rieder form of myelocyte
33. Myelocyte with mitosis (Klein, Fol. haem. x. p. 475)
34. Metamyelocyte
35. Non-granular metamyelocyte
36. Basophile metamyelocyte
37. Lymphoidocyte
38. Leucocytoid lymphoidocyte
39. Dwarf or micro-lymphoidocyte
40. Rieder lymphoidocyte
41. Plasma-cell lymphoidocyte
42. Sternberg's leucosarcoma cell (Klein, ibid.)
43. Juvenile macrolymphocyte (Klein, ibid.)
44. Normal macrolymphocyte
45. Senile macrolymphocyte
46. Lymphoid haemoblast
47. Hybrid eosinophile-mast cell

By permission from "Biology of the Blood-Cells

water and leave for one minute. The glass cover may be removed at this stage. Drain, but do not wash. Flood the slide with the following mixture freshly prepared: Into a little beaker pour 10 c.c. of distilled water. Drop 10 drops of Giemsa into this water. Mix quickly. After fifteen minutes, wash thoroughly in distilled water. Dry the slide, *but not over a flame*.

The variety of cells which it is possible to identify by this method, is considerable. They all agree in having simple nuclei, and in having a basophile cell body without granulation visible by the use of stains in vogue previous to the Romanowsky age. The variations in type are depicted on the accompanying coloured plate. (*Plate VI.*) The classes of cells thereon are also grouped under the following headings: Ancestral cells, juvenile cells, adult cells, and pathological or atypical forms. All the different forms of mononuclear leucocytes are depicted, some of the examples having been taken from the reviewer's collection, while a few (quoted in the legend) are derived from recent publications.

The procedure in examining blood-cells should be somewhat as follows: First make film preparations, and study the relative proportions between the different forms of cells, without laying too much stress on "exact" figures. Next make a total cell-count accurate to the nearest million or thousand, in the case of reds or whites respectively. The latter is more useful for surgical work.

In studying the films, the cells should be classified into (1) Immature forms, and (2) Mature forms; the relative proportions between (1) and (2) should be estimated as nearly as possible, because on the finding of greater or less evidence of deviation to the left, depends the formation of an opinion as to the reactive powers of the patient. It remains for routine study of the mononuclear cells, from this standpoint, to demonstrate the possibility of presenting valuable information about them to the clinician.

Applying the rules for diagnosing bone-marrow states from the differential *neutrophile* count, we should proceed with the lymphocytes and large mononuclears in the following way: (1) Note the *absolute cell-count* in order to determine whether there be hyperlymphocytosis (=absolute lymphocytosis) or absolute lymphopenia. This would serve to show whether there were a simple lymphocytic process in the hæmatopoietic tissue, or a hyperplastic process to be classed among the leukæmias. In connection with the latter, the question of *sub-lymphæmic* conditions has to be considered; (2) The relative proportions between total lymphocytes and the other cell-forms should be estimated. This may be done either in film preparations or by the direct method; (3) Examine the films with the oil-immersion lens in order to ascertain if there are only normal lymphoid forms, or whether immature forms are present as well: (*a*) If normal forms alone are present, see if they are relatively increased or not; (*b*) If immature forms are present, ascertain the relative proportions between them and the mature forms. The latter series of findings would indicate some

important change in the lymphoid follicles in some one or many parts of the body. Sublymphæmic conditions, where the total lymphocyte count is normal, but the cell-forms present are immature, will not be overlooked.

The following variants of simple lymphocytosis may be met with: (i) Total count increased—one of the forms of lymphocytes may be relatively increased, and a few juvenile forms be present; (ii) Total count increased—several forms of lymphocyte may be preponderant, and associated with ancestral and juvenile forms; (iii) Total count normal, also relative lymphocytosis, also absolute lymphocytosis; (iv) Total count normal, lymphocytes diminished (=lymphopenia); (v) Total count diminished, lymphocytes relatively increased, but absolutely diminished; (vi) Total count diminished, lymphocytes absolutely increased.

Lymphocytosis may appear in two phases, just as does leucocytosis. In the first phase, there is: (*a*) An increase in the percentage of one form of cell; (*b*) Absolute increase of lymphocytes. In the second phase, there is: (*a*) A stage in which there is merely an appearance of juvenile cells belonging to that variety which is relatively increased; (*b*) A further stage in which these young cells are actually preponderant. As a rule, the second phase is associated with lymphopenia. We may, then, expect the following groups of phenomena: (1) General hyperlymphocytosis, normolymphocytosis, lymphopenia; (2) Relative lymphocytosis; (3) Appearance of simple juvenile forms; (4) Prevalence of juvenile forms.

Expressed in another way, the following combinations may be fixed. They may be best expressed by the use of symbols. Let A represent the increase of one variety of lymphoid cell; let B represent that only mature cells are present; C that the total absolute count is normal; D that there is hyperlymphocytosis; E that there is absolute lymphopenia; F juvenile and ancestral forms. Thus we have:

A + B + C
A + B + D
A + B + E
A + C + F
A + D + F
A + E + F

The first phase of lymphocytosis would be D+A−F, or C+A−F; and the second phase would be either F+A+D, F (slight) +A+C, F (marked) +A+E, F+A+E, F+A+C.

The above scheme of systematization has been drawn up on the lines which Pappenheim[16] laid down for the case of neutrophilia. Whereas in this case the deductions to be made from the observations are comparatively easy, because the knowledge of the conditions which produce leucocytosis is fairly well advanced, it is not possible to be dogmatic about the significance of the above-suggested system for lymphocytes, and it remains for future investigations to show the practical importance of the study.

Estimation of Iron.—Twenty-five c.mm. of the blood are drawn from the lobule of the ear, the pipette is wiped clean, and the contents are discharged into an absolutely clean platinum crucible. The pipette is washed out with water and the washings are discharged into the crucible. The material is gently dried and burnt; 0·5 gram of potassium bi-sulphate is now added and the whole gradually heated more and more, till all the excess of bisulphate is decomposed. Now dissolve the cooled residue in minimal seminormal HCl, pour the solution into a 25 c.c. measure, and add more acid till 6 c.c. are present. Six c.c. of 10 per cent potassium sulphocyanide are added, and 10 c.c. pure ether. The mixture is well shaken and tested in the colorimeter. The instrument is standardized against a solution of iron ammonia alum of such strength that 1 c.c. contains ·005 mgram iron; the reading is taken at once in terms of mgram iron (Autenrieth and Funk[17]).

Opsonic Index.—A modification of the original method was made by Russ[18] to eliminate the mathematical error arising from the mode of counting the bacteria. This error was carefully worked out by Greenwood and White some years ago, and they concluded that the distribution of leucocytes (arranged with respect to the number of ingested tubercle bacilli) was highly asymmetrical in a film. According as the operator begins round any part of the field rich in one type of leucocyte or the other, the figure he will obtain will be a high or a low one. The necessary modifications consist (1) In using white cells only; (2) In maintaining the serum-bacilli-white-cell mixture in constant movement within the incubator. The white cells are (laboriously) collected by Ponder's method: blood is shed into a cell enclosed between two glass plates and incubated for twenty minutes. The cell is then opened, the clot removed, and the plates are washed in 1·25 per cent saline. Leucocytes, especially the polynuclears, will be found adherent to the glass surfaces. The plates are now flooded with 1·25 per cent salt solution and placed in the incubator for fifteen minutes. Leucocytes are now floating free, and are swept into a centrifuge tube by means of a glass rod. After a few minutes' centrifuging, the supernatant fluid is syphoned off, and the emulsion at the bottom contains only polynuclear leucocytes. This is used for making the opsonic-index estimation, and the pipettes are kept rotating by means of clockwork. The improvements were found to lie in a marked reduction of the liability to error (one-quarter), in a much reduced range of microbic contents of the leucocytes, and in a more even disposition of bacteria amongst the leucocytes.

Detection of Blood Stains.—Whitney[19] gives a satisfactory modification of the hæmin-crystal method:—

A minute fragment of the suspected substance (a scraping from a stain or a bit of stained fibre) is placed on a slide, and a very small drop of formic acid, sp. gr. 1·20 (Merck) (or hydrobromic acid 34 per cent Merck, 1 drop; formic acid as quoted, 4 c.c.) is brought over this with a glass rod. Over the drop is inverted a small watch glass,

which should not touch it, nor project beyond the edge of the slide. A gentle heat is applied directly beneath the drop, and the moment condensation is seen on the inside of the watch glass, the heat is discontinued, the watch glass lifted off, and the remainder of the fluid allowed to evaporate in the air. When dried, it can be examined microscopically, and mounted permanently in a drop of Canada balsam. The crystals are very small, usually requiring a high dry or oil-immersion lens to see them well, but they are so numerous that they cannot be overlooked.

REFERENCES.—[1]*Lancet*, 1912, i, 1526; [2]*Johns Hop. Hosp. Bull.* 1911, 369; [3]*Münch. med. Woch.* 1911, 445; [4]*Johns Hop. Hosp. Bull.* 1912, 144; [5]*Med. Press and Circ.* 1912, i, 432; [6]*Lancet*, 1912, i, 389; [7]*Amer. Jour. Med. Sci.* 1911, ii, 698; [8]*Brit. Med. Jour.* 1911, ii, 1586; [9]*N. Y. Med. Jour.* 1912, i, 173; [10]*Jour. Cut. Dis.* 1912, 53; [11]*Jour. Amer. Med. Assoc.* 1911, ii, 1926; [12]*Johns Hop. Hosp. Bull.* 1911, 428; [13]*Ibid.* 369; [14]*Lancet*, 1912, ii, 355; [15]*Dominion Med. Monthly*, 1912, Sept; [16]*Grundr. der Hamatol. Diag.* 1911; [17]*Münch. med. Woch.* 1912, 764; [18]*Lancet*, 1912, i, 1461; [19]*Bost. Med. and Surg. Jour.* 1912, i, 562.

BLOOD-PRESSURE. *Carey Coombs, M.D., M.R.C.P.*

Sphygmomanometry.—The value of routine measurements of the arterial tension formed the subject of an interesting discussion at the Medical Society of London introduced by de H. Hall.[1] Some of the many useful remarks made may be quoted. To illustrate the diagnostic value of the practice, L. Brunton quoted a case of sudden hemiplegia which he had been able to assign correctly to cerebral thrombosis and not hæmorrhage, by the discovery of a blood-pressure of 135 mm. The introducer gave figures from his practice showing the prognostic importance of accurate measurements of systolic pressure. However, as one member sensibly observed, high arterial pressure is only a symptom, and treatment must be directed to the cause. Rather high pressures, if not perceptibly rising and if found after middle life, are not of necessity alarming; and above all things it is most unwise to allow patients to think about their own pressure.

As to *technique*, most were agreed that for routine work, measurement of the systolic pressure with Martin's modification of the Riva-Rocci apparatus was the most valuable; but several spoke of the need for fuller knowledge of diastolic pressure, and of the suitability of the auscultatory method of Korotkow, Oliver, and others, for measuring this. Gossage remarked that not infrequently the excitement caused by the sight of the instrument and its application induced a rise of pressure which wore off after a few minutes.

Watson Wemyss[2] points out that the Pachon oscillometer, described fully in last year's ANNUAL, gives higher readings than other sphygmomanometers, and that the discrepancy is greater the higher the pressure. Windle[3] has been using the radial artery lever of the Mackenzie polygraph, instead of the finger, to determine the moment of disappearance of the radial pulse in sphygmomanometric readings.

He finds that with this more delicate method his readings work out 10 to 15 mm. higher than when the finger only is used.

The association of *low arterial tension* with splanchnoptosis and atony of the abdominal wall has been investigated by Birtch and Inman,[4] who find a fall in the systolic and diastolic pressure in patients of this kind when they rise from a lying to a standing posture, if they feel subjective symptoms such as vertigo, insomnia, etc., such as may be referable to cerebral anæmia. These symptoms they believe to be due to the low blood-pressure.

High Arterial Tension.—Lee[5] has analysed the autopsy findings in fifty-three cases of hypertension. Renal lesions were present in over 70 per cent; these were not always of the atrophic type, acute or subacute glomerulonephritis being noted several times.

Treatment.—Of course the proper line of attack is upon the cause rather than on the raised tension itself. Indeed, actual harm may be done in some cases if treatment succeeds in lowering pressure, as French[6] insists; the rise in tension is compensatory for some renal or other defect, and without it the circulation through the vital organs becomes ineffective. However, immediate risks are involved when the tension rises above 180 mm., so that any method which can be depended on to bring such pressures back within the limits of safety is not to be despised. Various writers (Burch,[7] Nagelschmidt,[8] Snow,[9] Guilleminot[10]) speak very highly of **Electrotherapeutic** methods —D'Arsonvalization and high frequency—as producing an immediate and enduring fall of pressure. It is to be noted, however, that all these favourable reports come from electrotherapeutists, while the opinion of general physicians, such as that of Lawrence,[11] is not so favourable. This writer made a systematic research into the efficacy of various means for lowering pressure, and found that vasotonin sent it up instead of down; that the **Nitrites** were effective in different degree, the action of erythrol tetranitrate and sodium nitrite being more prolonged than that of amyl nitrite and trinitrin; that the effect of high-frequency currents is not constant; and that **Venesection** produced a fall of 10 to 40 mm., lasting up to twenty-four hours. (*See also page* 49.)

References will also be found to the use of **Diathermy** (*page* 76) and **Radio-active Baths** (*page* 72),

References.—[1]*Clin. Jour.* 1912, ii, 321; [2]*Brit. Med. Jour.* 1911, ii, 1472; [3]*Lancet*, 1911, ii, 1397; [4]*Jour. Amer. Med. Assoc.* 1912, i, 265; [5]*Ibid.* 1911, ii, 1179; [6]*Lancet*, 1912, ii, 69; [7]*Med. Rec.* 1911, ii, 866; [8]*Brit. Med. Jour.* 1911, ii, 900; [9]*Med. Rec.* 1911, ii, 1222; [10]*Sem. Méd.* 1911, 543; [11]*Bost. Med. and Surg. Jour.* 1911, ii, 683.

BLOOD STAINS, DETECTION OF. (*See* Blood, Examination of.)

BOILS.

(*Vol.* 1912, pp. 96, 487)—It is claimed that **Zinc Ions** introduced by means of a zinc needle inserted into the diseased area and acting as an anode will abort boils in one or two days. For those that have developed, the use of **Staphylococcus Vaccine** is more and more recommended.

BONE DEFECTS.

(*Vol.* 1912, p. 176)—For the filling of bone defects such as follow some compound fractures, acute osteomyelitis, tuberculosis, and excavating operations on healthy bone, the use of **Moorhof's Plugging Wax** is recommended. Details of technique are given.

BONE, INFLAMMATION OF. (*See* OSTEOMYELITIS, *and* SINUSES.)

BONE, TUBERCULOSIS OF. (*See* TUBERCULOSIS, SURGICAL, *and* SINUSES.)

BRAIN, SURGERY OF. *E. W. Hey Groves, M.S., F.R.C.S.*

Tumours.—Although a great deal of attention is being paid to the diagnosis and operative technique of this subject, it is admitted on all hands that the results obtained in the direction of permanent cure are very meagre and disappointing: so much so, that most neurologists are now content with the palliative operation of decompression in all cases where the site of the growth cannot be located definitely, in some area reasonably accessible to surgical attack.

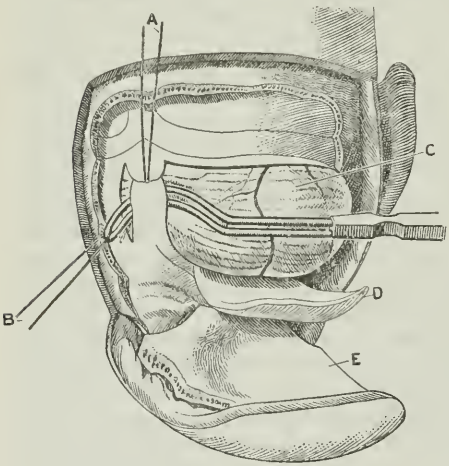


Fig. 11.—Exposure of cerebellum and ligature of the occipital sinus (*after Krause*). A, Occipital sinus ligature; B, Second ligature being passed under the occipital sinus; C, Lobe of the cerebellum; D, Dura mater; E, Osteoplastic flap.

(A case of successful localization of a tumour by *x*-rays is alluded to at *page* 56).

Von Eiselsberg[1] gives an account of 100 cases of tumour of the brain treated by operation. These are divisible into groups. There were 43 cases of suspected cerebral tumour, in 32 of which the diagnosis was correct. For cerebellar growths there were 22 operations, 11 of which confirmed the diagnosis. The remainder consisted of pontine tumours (12 cases), pituitary tumours (13 cases), decompression operations (10 cases). The proportion of erroneous to correct diagnosis in cerebral (1 in 4), and in cerebellar tumours (1 in 2) is very instructive. Of the 32 cases where a tumour of the cerebrum was found, 9 died of the operation, and 12 were alive at periods varying from five years to four months. Of the 11 cases of cerebellar tumour, 5 died of the operation, but only one patient was alive at the end of two years. Of the 12 pontine tumours (sometimes called acoustic, or tumours of the cerebello-pontine angle) only 4 survived the operation, and these were alive for periods from two and a half to one year afterwards.

He recommends a **Two-Stage Operation** in all cases. **Urotropin** is given for some days beforehand as a prophylactic against infection, as this drug is excreted in the cerebrospinal fluid. A week to ten days is allowed to elapse between the raising of an osteoplastic flap and the opening of the dura. The wound is never packed or drained; if bleeding persists from the deep structures, this is controlled by the application of a portion of living tissue, e.g., muscle or fascia, rather than by gauze; if a large defect is left in the dura, this is made good by transplantation of a piece of the fascia lata from the patient's own thigh. He speaks highly of this latter procedure, which he carried out in seven cases, with excellent results in all.

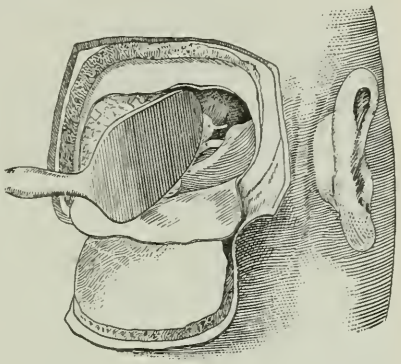


Fig. 12.—Retraction of the right cellebellar hemisphere so as to expose the region of the right auditory nerve (*after Krause*).

Taylor[2] also gives an account of a consecutive series of operations, 63 in number, for brain tumours. Only in 30 could the tumour be removed, and of these only 3 were alive three years afterwards. Six cases were growths of the dura, and 3 of these died of hæmorrhage at the time of the operation; 8 were cysts, 4 affecting the cerebrum and 4 the cerebellum; of these, 6 recovered, one was alive five and a half years later. Of the 63 cases, 19 died within ten days of the operation.

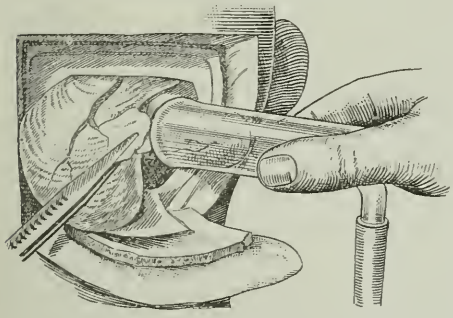


Fig. 13.—The soft pontine tumour is drawn out of its bed by aspiration through a glass tube (*after Krause*).

Tumours of the Cerebello-pontine Angle. — Whilst these growths are perhaps the most difficult of attack, the symptoms they cause are so severe that it is worth taking any risk for their removal. Pascalis[3] gives a careful review of this subject, detailing the technique used by all the surgeons who have operated on such cases. It was in 1894 that Ballance recorded the first successful attack, and there have been 113 operations in all. The tumour is usually about the size of a small pigeon egg, and of the nature of a fibroma or fibro-sarcoma. Arising as it does from that region of the pons which is associated with the origin of the 7th to the 10th cranial nerves, and being in close relation with the cerebellum

and medulla, it causes manifold symptoms. It rapidly gives rise to the signs of increased intracranial tension, namely, headache, vomiting, and optic neuritis. The gait becomes staggering from pressure upon the cerebellum, the muscles of the opposite side are paretic from pressure upon the pyramidal tract above the decussation, and the lower cranial nerves of the same side, i.e., the side of the tumour, become affected. Most notably is this the case with the facial and acoustic nerves, causing facial paralysis and subjective symptoms of tinnitus or deafness.

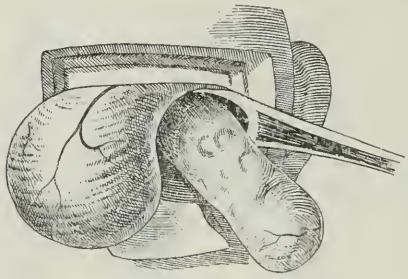


Fig. 14.—The tumour, having been drawn downwards by aspiration, is being removed by a cutting curette (*after Krause*).

In discussing the operative technique, that of Krause is given in greatest detail. An osteoplastic flap is turned down, exposing one or both cerebellar hemispheres. At a later stage, the dura is incised and the occipital sinus ligated. Then the cerebellum is retracted away from the affected side and the connections of the tumour are examined. In many cases a suction tube is used into which the soft tissues of the tumour are drawn, and then removed. (*Figs.* 11, 12, 13, 14.)

Acromegaly and Pituitary Tumours.—The subject of the surgical treatment of these conditions is receiving an increasing amount of attention, particularly in those cases where pressure upon the optic chiasma has produced such serious loss of vision that blindness is threatened. It is manifest that in many of these cases the lesion is chiefly a mechanical one of pressure, and that if the bony wall which lodges the pituitary gland can be opened, and a portion of its contents removed, the symptoms become alleviated. At present it is quite certain that no operation has been proposed capable of effecting a radical removal of a pituitary growth, but nevertheless the partial operations have been attended with a most gratifying success. Evans[4] gives a useful and detailed account of the symptoms of hyperpituitarism or acromegaly on the one hand, and hypopituitarism or ateleiosis or dystrophia adiposo-genitalis on the other, with illustrative examples of each condition, and radiograms showing alterations in the shape and size of the sella turcica in which the pituitary body is lodged. (*Plates VII and VIII.*) (*See also* PITUITARY BODY.)

Toupet[5] reviews the whole subject of the surgery of the pituitary body. In fourteen cases studied post-mortem, it was found that in eleven the tumour had invaded the intracranial cavity beyond the limits of the pituitary fossa, thus proving that in the majority of such cases the tumour can be only partially dealt with by an extra-cranial route. Further, it is shown how variable is the disposition of the sphenoidal air-cells in these conditions, so that it cannot be predicted

PITUITARY GROWTHS

Fig. A.—Radiogram of the skull of patient shown in *Plate VIII., A.* The great enlargement of the pituitary fossa is well seen.

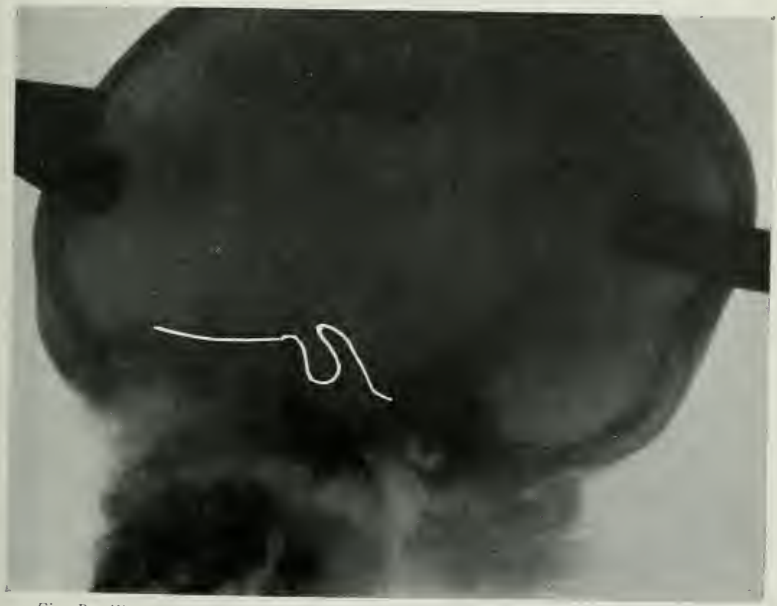


Fig. B.—Illustrates the opposite condition, in which the sella turcica is very small. From a patient of 15 years whose physical and mental development became arrested at 6 years.

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PLATE VIII.

PITUITARY GROWTHS

Fig. A.

Well-marked case of Ateleiosis. The patient is the smaller figure, aged 51; note the contrast between him and his younger brother, aged 32. He stopped growing at the age of 14; at 42 he began to lose his vision and suffer from headache and giddiness. The epiphyses of the long bones are not united to the shafts.

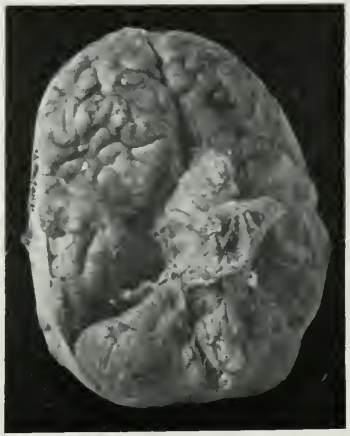

Fig. B.

The brain of the same patient. The sella turcica has been removed along with the pituitary growth.

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what access they will give to the seat of disease. In eight cases out of forty the tumour was cystic; in nearly half it was an adenocarcinoma.

An analysis is made of the fifty-six published cases in which an operation has been performed, and the best method is discussed. As between the intracranial route and the extracranial, the former has caused a far higher mortality and is not justified by the fear of meningitis being set up by the latter. The cavity containing the pituitary gland is so shut off from that of the general cranium, that its position may be regarded as practically extracranial. Further, when the tumour has largely extended beyond the sella turcica, it is so surrounded by great vessels as to be unapproachable. It is held that practically only two methods of approach have been justified by their operative results, namely, the nasal route after temporary resection of the nose, and the endonasal method. Out of fifty-six cases, there have been thirty-three by the rhinotomy method, with a mortality of 48 per cent, and fifteen by the endonasal, with a mortality of 13 per cent. Against this comparative mortality must be set the fact that rhinotomy gives a far better approach, with the possibility of a much more radical operation. Further, the endonasal method is available only to those with exceptional skill and experience in rhinology.

The method with Rhinotomy is given in some detail. It is important to avoid operating in conditions of acute nasal catarrh. A preliminary laryngotomy is done, and the pharynx is packed. The nose may be turned down by a ∩-shaped flap, or split in the form of a Y, both bones and soft parts being cut through in each case. The frontal sinuses are opened, and their anterior walls removed. The upper part of the nasal septum and the greater part of the ethmoid bone are cleared away, and thus the sphenoidal air-cells are exposed. Through these the antero-inferior wall of the pituitary fossa is removed, and the growth scraped away with a spoon. The cavity is drained through the nostrils, and the nose carefully restored to its position (*Figs.* 15 to 19).

The ultimate results of these operations are given in twenty-three cases. In twenty-one the vision was improved, and in several the general evidences of acromegaly became less. In one of these latter cases the improvement has lasted for three and a half years. It is probable that if a more careful regard was paid to the *x*-ray pictures of the form of the sella turcica, the cases might be so selected for operation as to give much better results.

Hirsch[6] discusses the question from the rhinologist's point of view, and then gives his remarkable and brilliant results. The manifestations of pituitary disease are classified into (1) Acromegaly; (2) Degeneratio adiposo-genitalis, both of these being often associated with (3) Visual defects, which may, however, arise without marked general phenomena. Dimness of vision is first complained of, and on examination it is found that the visual fields are much restricted, especially on the temporal sides, or there may be definite bi-temporal hemianopsia.

The intracranial method of attack (Horsley's by the temporal route, and Krause's by the frontal) are dismissed because of their

Operation for Exposure of the Pituitary Body after Resection of the Nose (*after Proist*).

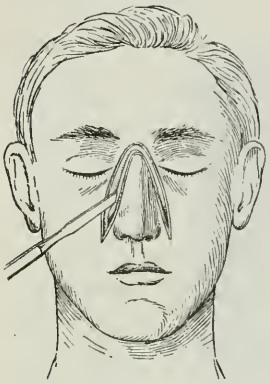


Fig. 15.

Incision through soft parts, afterwards deepened through the bone.

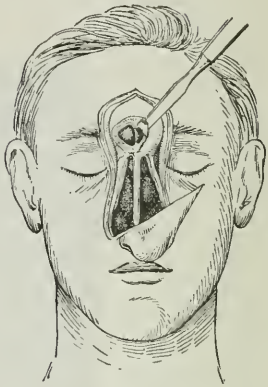


Fig. 16.

The nose is turned down, the frontal sinuses are exposed, and their front wall removed.

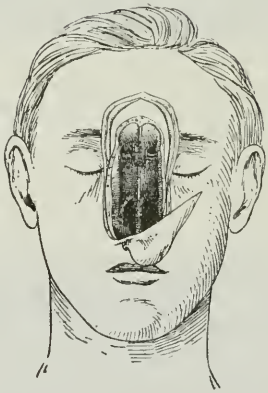


Fig. 17.

The nasal septum is removed, and the ethmoid cells opened by curetting.

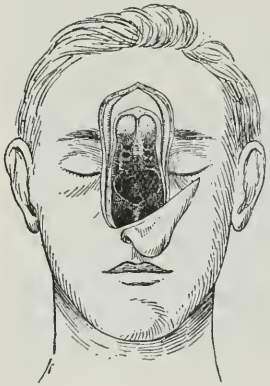


Fig. 18.

The sphenoidal cells are opened, and the floor of the sella turcica is bulging into them.

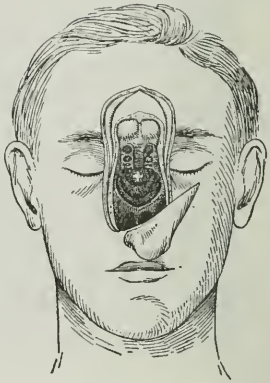


Fig. 19.

The floor of the sella turcica is cut open so as to give access to the pituitary fossa.

great difficulty and danger. Schloffer's nasal route, after rhinotomy and opening of the frontal sinuses, is that by which far the largest number of cases have been attacked. But in fifty-three cases by this method there have been twenty-one fatalities. Hence the author was led to work out his **Endonasal Method.** The whole procedure is carried out under local anæsthesia, and requires several sittings. First, the greater part of the lateral masses of the ethmoid bone, including the middle turbinates and ethmoid cells, are removed, and then the upper part of the nasal septum. Lastly, the sella turcica is opened through the sphenoidal sinuses and its contents are gouged out as far as possible. Twelve cases are shortly narrated, and of these two only were fatal, both, however, from extrinsic causes, e.g., pneumonia. In all that recovered, i.e., 10 out of 12, the visual defects were greatly improved, and in one case of acromegaly, the thickened condition of the tongue, face, and hands gave place to a normal one.

Chiari[7] suggests a method which is a compromise between the rhinotomy of Schloffer and the endonasal method of Hirsch. After a preliminary tamponade of the nasal cavities, an incision is made in the angle between the orbit and the nose. Through this are removed the nasal process of the maxilla, the lateral mass of the ethmoid, and the highest part of the septum. The sphenoidal sinuses now come into view, and after removal of their walls, the sella turcica can be opened. It is claimed for this method that the skin incision is small and inconspicuous, that the whole operation can be performed at one sitting, and that the channel of approach is more direct and 3 cm. shorter than that of the endonasal route. Two successful cases are related; in both vision was greatly improved, and in one the coarse thickening of the face, hands and feet disappeared.

McArthur[8] suggests a **Transfrontal Method** for approaching the pituitary body. An incision is made through the midline of the forehead and along the eyebrow; a piece of the frontal bone including the orbital roof is removed and preserved for replacement; the dura is opened just above the optic chiasma, and the pituitary growth removed from within the cranial cavity.

He also mentions Cushing's **Transbuccal Method.** The nasal cavity is opened between the upper lip and the gums, the whole of the septum nasi is resected by the submucous method, and the two halves of the mucous septum are separated by a special valved speculum. Through this narrow aperture the sphenoidal cells are reached, and beyond them the pituitary cavity.

Puncture of the Brain for Diagnosis.—This method is now largely used by German neurologists. It is described and advocated by Pfeifer.[9] Under local anæsthesia over the region to be explored, the skull is opened by a 3-mm. borer. Then a blunt-pointed hollow platinum needle, 1·5 mm. thick, containing a silver stylet, is thrust about 3 to 4 cm. into the brain. The stylet is removed, and by means of an all-glass syringe, a cylinder of brain tissue is sucked up into the

needle and cut into serial sections. It has been employed by Pfeifer in sixteen cases of tumour, one case of cysticercus, and one of hydrocephalus. In four of the tumour cases, the diagnosis was made at such an early stage that timely operation was possible and resulted in lasting cure. In one case the puncture proved fatal, the needle wounding a vessel pushed up by a tumour of the corpus callosum.

Intracranial Hæmorrhage.—The terrible after-results of intracranial hæmorrhage in infancy are well known. Infant mortality, idiocy, and paralysis are its usual effects. Unfortunately the matter is often overlooked just at the time when something could be done, i.e., within a few days after birth. We owe it chiefly to Cushing that the possibility of operating successfully on these cases has been presented to us. Simmons[10] relates two interesting cases in which a simple procedure obtained successful results. In both, the typical condition was present, i.e., a difficult labour, non-pulsation of the fontanelles, convulsions, with some spastic paralysis. In each the skull was opened through the coronal suture, making a separate incision on each side. It was found that with the yielding bones of infancy this incision gave sufficient access to open the dura and clear out the blood-clot. It certainly presents less shock than the formation of an osteoplastic flap.

Jones[11] brings forward interesting anatomical evidence to show that the extradural hæmorrhage associated with the middle meningeal vessels, is really due to a rupture of the veins and not of the artery. Normally each meningeal artery is accompanied by two comparatively large venous sinuses, which run between the layers of the dura mater, and are responsible for the grooves on the inner surface of the skull usually attributed to the artery. In three cases of fatal hæmorrhage examined post mortem, he shows by section of the dura and clot that it was rupture of the sinus and not of the artery which took place. This would explain the comparatively trivial injuries which cause serious hæmorrhage, especially in children ; the dark colour of the clot ; and the very slight hæmorrhage found when the bleeding area is exposed.

Decompression of the Brain.—As already stated, this operation is being much more widely adopted as a most efficient palliative measure in cases of *tumour* which cannot be located or removed. There are two methods in common use : (1) Mere removal of a portion of the skull with incision of the dura, which is liable to be followed by a hernia cerebri ; or (2) A submuscular trephining under the temporal or cervical muscles, the muscular mass being relied upon to prevent herniation. Hudson[12] proposes to make a much wider opening in the skull, including a large portion of the occipital and parietal bones, by raising up an osteoplastic flap. The dura, he suggests, should be divided in a ≷ or zig-zag fashion, and the bone replaced by expanding sutures of wire. He does not, however, meet the difficulty that the replaced bone flap would probably form osseous union before the new sutures had had time to expand.

PLATE IX.

SCIRRHUS OF THE BREAST (ULCERATING)

Bristol General Hospital, No. 6912. *Photograph, Geo. Scott Williamson, Pathologist.*

It was suggested some years ago that all those cases of *fractured base* in which coma is deep and prolonged, indicating a severe lesion with increased intracranial pressure, should be treated by temporal decompression and drainage. At present, however, we are unfortunately without any sufficient data from an authoritative source to form a judgment on the value of this suggestion. Payne[13] relates one successful case. A sailor who had fractured his skull at sea, was brought into hospital, and after three days' profound coma with hemiplegia, was trephined, and a large osteoplastic flap raised in the temporal region. On opening the dura, no clot was found over the motor area, but on raising the temporal lobe, about an ounce of blood escaped, with clots and pieces of brain tissue. A rubber drain was passed down to the base of the skull, where the fracture could be felt. The pulse immediately rose from 44 to 70, and within a week both coma and paralysis had passed off, leaving only a partial facial palsy.

References.—[1]*Wien. klin. Woch.* 1912, 17; [2]*Ann. Surg.* 1912, ii, 55; [3]*Rev. de Chir.* 1912, 53; [4]*Brit. Med. Jour.* 1911, ii, 1461; [5]*Rev. de Chir.* 1912, 900; [6]*Berl. klin. Woch.* 1911, 1933; [7]*Wien. klin. Woch.* 1912, 5; [8]*Jour. Amer. Med. Assoc.* 1912, ii, 2009; [9]*Brit. Med. Jour.* 1911, ii, 745; [10]*Bost. Med. and Surg. Jour.* 1912, i, 43; [11]*Lancet*, 1912, ii, 7; [12]*Ann. Surg.* 1912, i, 744; [13]*Jour. Amer. Med. Assoc.* 1912, i, 472.

BREAST, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

In *Plate IX* is illustrated a condition rarely seen now—a scirrhous cancer of the breast which has infiltrated freely through the skin.

Judd[1] says it is most unreasonable to classify tumours of the breast into two categories, and to assume that fibroid and cystic tumours in other parts of the body should be removed, but that such growths in the breast should be allowed to remain. The growth should be removed, if malignant, by a radical excision; if regarded as innocent, and found to be so after removal, excision of the tumour is sufficient. If examination after excision shows malignancy, the radical operation should be immediately performed. Halsted has shown that if a malignant cyst be recognized and radical excision performed at once, the outlook is favourable. On the other hand, if we fail to discover the malignancy before the wound in the breast has healed, in all probability there will be recurrence.

Cancerous bone-metastasis may occur with no obvious lymphatic gland invasion, and if bone invasion is suspected the *x*-rays may give some information. Judd has by this means observed involvement of the vertebræ in cases which otherwise would have been considered favourable for operation. The bones present moth-eaten mottled areas of rarefaction.

He gives the statistics of 518 cases of carcinoma of the breast. The average age was fifty-five years six months; the oldest seventy-five, the youngest twenty-one. In 89 cases, over ten years had elapsed since operation; of these, 21 (23·5 per cent) were alive and well, 23 dead, and 45 not heard from. Of 239 operated on over five

years, 74 (30 per cent) were alive and well, 76 were dead, and 89 not heard from. Of 518 cases operated on over two years, 233 (44 per cent) are alive and well, 134 are dead, and 151 not heard from. These statistics show that the percentage of cures if the cases are traced for long periods is not so great as some surgeons think.

Prof. d'Este,[2] of Tansini's clinic in Pavia, gives a full description of the operation devised by the latter for amputation of the cancerous

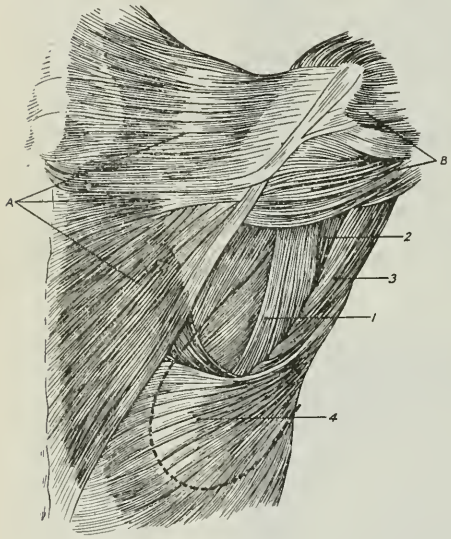


Fig. 20.

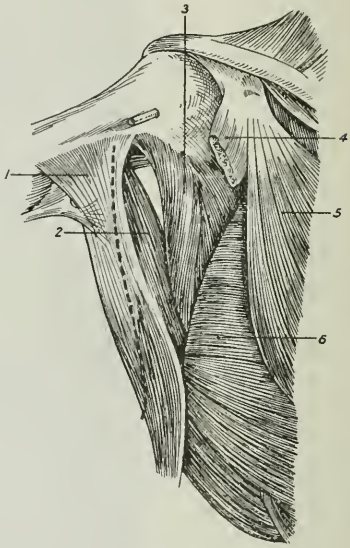


Fig. 21.

Fig. 20.—Dissection of the muscles of the back, showing the muscles which form part of the dorsal flap to fill in the gap left by amputation of the breast in Tansini's operation. The dotted line marks out the limits of the flap, which consists of the skin overlying the muscles. 1, Infraspinatus; 2, Rhomboideus minor; 3, Rhomboideus major; 4, Latissimus dorsi. A, trapezius; B, Deltoid.

Fig. 21.—The front view of No. 1. The dotted line indicates the anterior limit of the flap. The figure shows the tendon of the latissimus dorsi 1, which enters into the formation of the flap; 2, Rhomboideus major; 3, Subscapular; 4, Tendon of the coraco-brachialis, which has been removed; 5, Pectoralis minor; 6, Serratus magnus.

breast. For a successful operation two things are essential: (*a*) Complete removal *en bloc* of the whole diseased mammary region; and (*b*) Removal, complete and *en bloc*, of all the anatomical layers outside this region containing the routes of diffusion, either laterally or perpendicularly, of the malignant process. He thinks the operative procedures which have been so far used by various surgeons do not completely fulfil these two necessary requirements, especially as

regards the removal of a sufficient amount of skin. Even in early cases, he says, the following structures are suspect and ought to be removed: the whole of the mammary gland; the fatty connective tissue which surrounds it on every side, including the interscapulo-thoracic tissue; the axillary lymphatic system; the retro-pectoral and infra-clavicular lymphatic glands, and the connective tissue underneath the pectoralis major. If the mamma extends, however little, beyond the inferior lateral limit of the large pectoral, then the fascia of the serratus magnus, the digitations of the external oblique of the abdomen, and the fascia over both muscles ought to be considered as infected. Whatever may be the method of propagation of cancer, the skin of the mammary region ought to be regarded as infected,

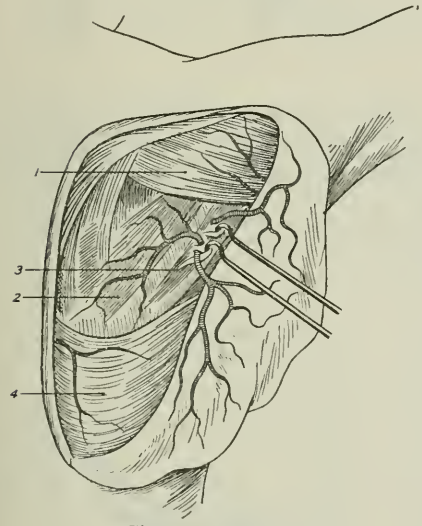


Fig. 22.

Fig. 22.—Dissection of the subcutaneous layer of the right scapular region and of the upper portion of the corresponding infrascapular region, showing the presence of three arterial vessels which, coming to the surface of the aponeurosis covering the muscles of the subspinous fossa, branch in the subcutaneous tissue, and supply nourishment to the skin covering this region. The point at which these vessels become subcutaneous is in most cases the triangular space between the small rhomboid, the great rhomboid, and the long head of the triceps. In other cases these vessels pass above the superior median border of the lesser rhomboid, or between the fibres of the muscle at this border as shown in the figure. 1, Posterior fibres of the deltoid; 2, Fibres of the infraspinatus seen through its aponeurosis; 3, Rhomboideus minor; 4, Latissimus dorsi.

even if the growth be in a very early stage. Tansini's operation therefore includes removal *in toto* (without dissection of any flaps) of the mammary gland, with all the skin which covers it, with the small and great pectorals, and the glands and tissue in the axillary space.

These indications are admitted by every English and American surgeon of any repute, and the operation designed by Tansini differs only from that of most surgeons in removing a larger area of skin and covering the wound with a musculo-cutaneous flap taken from over the scapula. French and Belgian surgeons, however, do not seem to remove the diseased tissues so extensively as British and American surgeons. The procedure is well shown in the accompanying illustrations, *Figs.* 20 to 29.

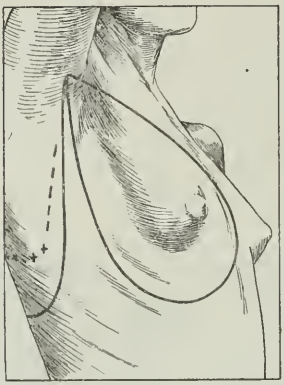


Fig. 23.

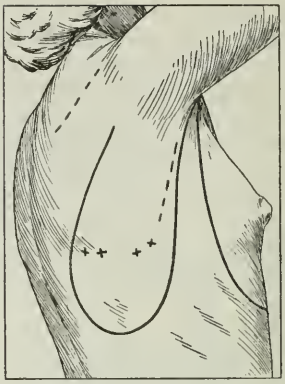


Fig. 24.

Fig. 23.—Outline of the skin incision. The figure is somewhat foreshortened, so that the incision appears too near the breast. It will be seen that the incision goes beyond the corresponding edge of the sternum. Behind are seen the anterior and lower limits of the dorsal flap which is to fill in the cavity left by removal of the breast. The dotted line marks the axillary border of the scapula.

Fig. 24.—Dorsal and lateral view of the same patient as in *Fig.* 23. The upper dotted line marks the spine of the scapula, and the other dotted line the axillary border of the scapula. The four crosses mark the lower end of the scapula.

Fig. 25.

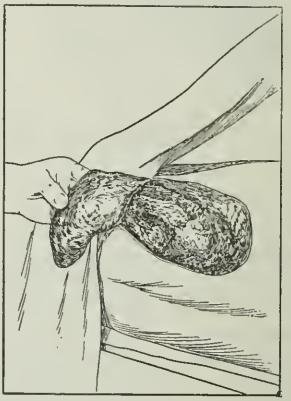


Fig. 26.

Fig. 25.—Shows the formation of the dorsal flap, especially the detachment of the insertion of the rhomboideus major, marked by a *. The knife must be kept near the bone in order to avoid cutting the vessels shown in *Fig.* 22.

Fig. 26.—The dorsal flap is cut and ready to be turned forwards to fill the gap left by removal of the breast.

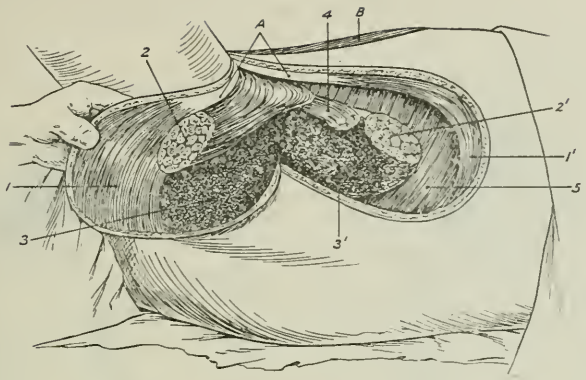


Fig. 27.

Fig. 27.—In part semidiagrammatic : shows the constitution of the dorsal flap, which is formed of two layers, a subcutaneous one and a muscular one. The latter is formed by : 1, A portion of the latissimus dorsi with a band of its tendon ; 2, Rhomboideus major ; 3, Infraspinatous fossa covered by the small portion of muscle which remains after dissection of the infraspinatus muscle 3 ; 4, Serratus magnus. A, The tendon of the latissimus dorsi divided almost as far as the humerus ; B, Mammary wound.

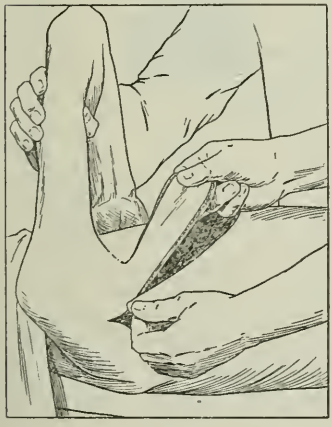


Fig. 28.

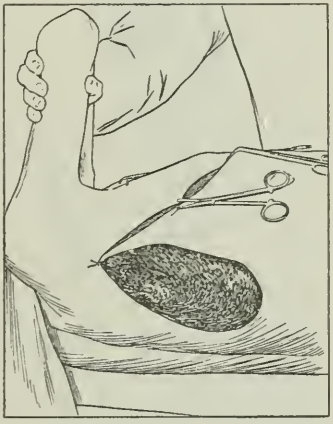
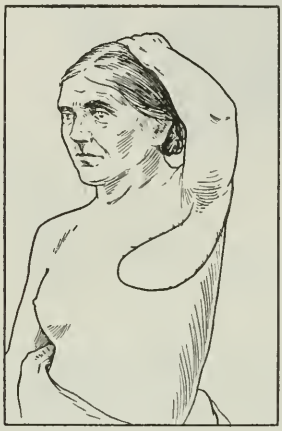


Fig. 29.

Fig. 28.—Shows the transplantation of the dorsal flap to fill the mammary wound. Note the tongue of skin which passes backward to the apex of the space left by removal of the dorsal flap.

Fig. 29.—Last stage of the operation, where the dorsal flap has been transplanted and the skin edges are ready to be approximated.

The condition of the patient after recovery from the operation in regard to the mobility of the arm, is sufficiently indicated in *Figs.* 30 to 33.



Figs. 30 and 31.—Patient 22 days after operation.

Figs. 32 and 33.—Patient one month after operation.

References.—[1]*N. Y. Med. Jour.* 1912, i, 867; [2]*Rev. de Chir.* 1912, 164.

BREAST, SINUSES IN

(*Vol.* 1912, p. 63)—The sinuses which linger for weeks after suppurative mastitis may be induced to heal by the persistent use of **Vaccines** combined with **Gauze Drains** soaked in hypertonic citrated salt solution.

BRILL'S DISEASE. (*See* Typhus Fever.)

BRONCHIECTASIS. (*See* LUNGS, SURGERY OF.)

The use of **Urotropin** is suggested at *page* 16.

BRONCHITIS. *J. J. Perkins, M.B., F.R.C.P.*

TREATMENT.—Vanderhoof[1] recommends the use of **Urotropine** in the treatment of coryza, and acute and chronic bronchitis. The dose must be comparatively large, gr. 10, dissolved in a full glass of water, four times daily for three to seven days, after which the drug is discontinued. The patient is always instructed to drink water copiously during the time the drug is being administered, and with these precautions, Vanderhoof, in a large experience, has met with only one case in which irritation of the bladder was caused. He was led to employ the drug from the experimental result that the drug could be detected without difficulty in the sputum after a daily dose of gr. 25, and he finds its effects incomparably superior to those of the usually employed remedies. The temperature rapidly falls under its use, and the räles disappear. He, however, was disappointed with its effects in patients with extreme arteriosclerosis.

Fungous Tracheo-bronchitis.—Hoxie and Lamar[2] quote two cases of this rare complaint, in one of which the chief symptom was spasmodic cough; in the other, hæmorrhage. Tubercle bacilli were absent from the sputa of both patients, and portions of fungus were regularly present. In both instances culture was impossible, so that no satisfactory identification of the fungus could be obtained. **Potassium Iodide** was the only effectual means of relief.

Intratracheal Injections.—Guisez and Stodel[3] have shown that it is possible to introduce very large volumes of fluid, 15 to 20 c.c., into the bronchi without discomfort. The technique they employ is to anæsthetize the base of the tongue and pharynx with cocaine, and then by the aid of the laryngoscope to inject 1 or 2 c.c. of a 1–40 solution of novocaine, to which a few drops of adrenalin ·1 per cent have been added, into the trachea. Anæsthesia is sufficiently established at the end of three or four minutes for the tolerance of large injections. Guided by the laryngeal mirror, the end of the syringe is passed between the vocal cords downwards for some 10 cm. This suffices for a simple tracheal injection, but if it is wished to direct the fluid into one or other bronchus, the patient must be laid on the affected side and the end of the syringe turned in that direction. A slight cough is the only unpleasant symptom as a rule after an injection of 15 to 20 c.c., and this does not occur with a little practice; if, as occasionally happens, the cough is more violent, perhaps some 3 or 4 c.c. of the injection may be returned, but never more. By experiments with colouring matter on animals, and with bismuth, they have shown that substances introduced in this way are carried throughout the whole bronchial tree, and can even be made to impregnate the parenchyma of the lung.

Excellent results have followed this mode of treatment, in cases of tracheitis and tracheo-bronchitis, bronchial dilatation, and gangrene of

the lung; in the last named (and some six cases are referred to), results are spoken of as brilliant. The fœtor of the expectoration passes away, and the temperature drops to normal after three or four injections. The drugs injected by them comprise **Guaiacol, Iodoform,** and **Argyrol,** the last in 5 per cent solution.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 331; [2]*Ibid.* 95; [3]*Presse Méd.* 1912, 768.

BRONCHOPNEUMONIA.

It is claimed by Wright that injections of **Mercuric Succinimide** are of value (*page* 24).

BURNS. *Priestley Leech, M.D., F.R.C.S.*

I. F. Alexander[1] had to treat twenty-seven cases of burns simultaneously, and tried various methods in order to compare them. Four out of the twenty-seven developed duodenal ulcer, and extensive areas of skin were involved, but all recovered. Seven cases were treated by the boric-acid solution bath; picric acid was employed in five; carron oil in five, and unguentine in five, all cases of first, second, and third degree; and ichthyol ointment in five cases of the third degree. In every case all the lesions were thoroughly cleansed with soap and water before any dressing was applied. His conclusions are that in burns of the first degree **Picric Acid** gave the best results, and was also satisfactory in burns of the second degree; in burns of the second degree, the **Boric-Acid Bath,** and in burns of the third degree **Ichthyol Ointment,** gave the best results. The ointment consisted of gr. 48 of ichthyol added to 2 dr. of olive oil and incorporated with enough lanoline to make three ounces.

REFERENCE.—[1]*Med. Press and Circ.* 1912, 112.

CÆCUM MOBILE. *Robert Hutchison, M.D., F.R.C.P.*

By "cæcum mobile" is meant an abnormal mobility of the cæcum, so that it can be pushed up out of its normal situation. The condition may be purely anatomical and give rise to no symptoms, or kinks may be produced, causing partial or temporary obstruction, and ultimately leading to more or less atony and dilatation of the cæcum, with associated symptoms.

The term was first employed in 1904 by Haussmann,[1] who reported eight cases. His paper attracted little attention, and it was only after Wilms[2] had published a series of forty cases verified at operation that the condition became generally recognized.

The *symptoms* are variously described, but may be said, briefly, to resemble those produced by chronic appendicitis, and Wilms is of opinion that in many cases of so-called chronic appendicitis in which appendicectomy fails to relieve, a mobile cæcum has been the real cause of the patient's complaints. The chief *physical sign* is the presence of a palpable cæcum which can be displaced upwards. It is felt as a somewhat indistinct cylindrical or pear-shaped mass, slightly tender on pressure and often exhibiting gurgling on palpation. A

diminished resistance just below McBurney's point, or a hollowness of the iliac fossa due to the upward movement of the cæcum, has also been noticed.

The *treatment* is by no means definitely determined. Albu believes that internal measures, such as **Regulation of the Diet, Laxatives, Massage of the Abdomen,** and prolonged **Rest,** may be successful. Fischler advises a diet somewhat restricted and carefully adapted to the patient, massage, exercise to strengthen the abdominal muscles, and the administration of **Bismuth,** combined, if necessary, with **Magnesia** and **Rhubarb;** or if there is diarrhœa, **Bismuth Salicylate** may be used. Purgatives, and oil and other enemas, should be avoided.

The majority of writers, Haussmann, Wilms, Klose, regard surgery as the only satisfactory remedy. The nature of the operation is not settled. Wilms dissects upward a portion of the parietal peritoneum, leaving a pocket into which the cæcum is sutured. Rehn and Klose simply attach the cæcum to the lateral abdominal wall by sutures, securing a broad area of adhesions. This would seem sufficient in ordinary cases.

Sailer,[3] who has devoted considerable attention to the subject, is inclined to regard the atony of the cæcum in these cases as being of more importance than its mere mobility, and utters a warning against the danger of attempting to explain obscure abdominal symptoms merely by the fact that the cæcum is movable and palpable. He thinks that displacement of other parts of the colon or the co-existence of a catarrhal colitis or chronic appendicitis may have much to do with the symptoms.

Crämer,[4] also, is of opinion that "cæcum mobile" is not a disease itself, and demands no treatment—least of all surgical. Merkens[5], on the other hand, takes a middle position. He considers that Wilms' theory of the way in which a mobile cæcum produces symptoms must be given up. He agrees, however, with Rehn and Klose, that in a considerable number of cases diagnosed as chronic appendicitis the symptoms are caused by recurring or chronic *torsion* of the cæcum, although they have probably exaggerated the frequency of such an occurrence. Only those cases should be regarded as established in which the condition found at operation is unmistakable.

References.—[1]*Berl. klin. Woch.* 1904, 1153; [2]*Deut. med. Woch.* 1908, 1756; [3]*Amer. Jour. Med. Sci.* 1912, i, 157; [4]*Münch. med. Woch.* 1912, 709; [5]*Deut. med. Woch.* 1912, 848.

CANCER. (*See* Bladder; Breast; Lip; Prostate; Stomach; Testis; Tongue; Urethra; Uterus.)

In the general treatment of cancer the following are suggested, and their value discussed; **Fœtal Autolytic Products** (*page* 14); **Taraxacum** (*page* 42); **Vaccines** (*pages* 47, 48); **X-Rays** (*page* 60); **Radium** (*pages* 60, 64, 65); **Thorium** (*page* 69); **Uranium** (*page* 69); **Diathermy** (*page* 76).

CANCER, ABDOMINAL, DIAGNOSIS OF.

Robert Hutchison, M.D., F.R.C.P.

G. G. Turner[1] draws attention to the importance of pelvic deposits in the diagnosis of abdominal cancer. He emphasizes the fact that in cases of malignant disease in the upper abdomen, and especially with stomach cancer, while there may be no signs of dissemination to be made out on ordinary abdominal examination, and no ascites, *there may be quite a considerable deposit in the pelvis, easily recognizable on rectal examination and without any symptoms to point to its presence.*

Hence the need of routine rectal examination in all cases of suspected malignant disease anywhere in the abdomen, for the discovery of such deposits may not only establish the diagnosis, but may at the same time be the earliest clinical sign of inoperability, so far at least as radical measures are concerned.

REFERENCE.—[1]*Brit. Med. Jour.* 1912, i, 229.

CANCER, LABORATORY DIAGNOSIS OF.

Oskar C. Gruner, M.D.

(*See also* GASTRIC CONTENTS, *and* URINE.)

Meiostagmin Reaction.—The method of performing this was described in the MEDICAL ANNUAL for 1912. A considerable amount of literature has accumulated on the subject. A critical review by Bernstein and Simons[1] brings out some interesting points in connection with the subject, indicating peculiar discrepancies in the reports of the test. Thus, at one time an observer regards guinea-pig heart-extract as a useless reagent, but six weeks later considers that it is extremely useful, without stating the reason for his change of opinion. Similarly, at one time the antigen is to be diluted with saline, at another with distilled water. In a number of careful studies of the reaction by these writers, the conclusion is arrived at that the meiostagmin reaction has no real foundation which allows it to be of value for clinical work. Leidi[2] uses extract of pancreas instead of extract of tumours, and finds that it acts as well as tumour-antigen; the slightest trace of moisture will entirely ruin a given experiment; no test must be made without controls with a definitely neoplastic serum and a definitely non-neoplastic serum; only 80 per cent of Leidi's cases give a positive reaction; 20 per cent of his cancer cases give no reaction; only 91 per cent of non-cancerous cases give a definitely negative reaction; jaundice alone will give a positive reaction; and yet he says "the meiostagmin reaction is a diagnostic method of extreme importance"!

The finding by Michelli and Cattorelli[3] of a positive meiostagmin reaction in pneumonia, advanced cirrhosis of the liver, diabetes, advanced phthisis, and chloroform anæsthesia; and by Stammler[4] in some cases of scarlet fever, is not regarded by Izar[5] as detracting from the clinical value of the reaction. It seems more reasonable to say that the finding of the same reaction in diseases other than cancer is of considerable academic interest, but obscures the significance to the practitioner.

Freund and Kaminer's Reaction was also described in last year's ANNUAL. A further contribution on the diagnosis of carcinoma by the same authors,[6] gives their results on some early cases of cancer. Inhibition of solution of the cancer cells used for the test was found in 88 per cent. An early diagnosis was possible by this means. The evidence of cure after excision of the tumour lay in a loss of the reaction. The power of a serum to protect cancer cells from destruction by normal serum was also tested, and found to be present, even though the tumour was removed. The significance of these results was in its turn contradicted by Monakow,[7] who did not get anything like the same number of positive results.

Serum Reaction of Blood.—Shaw-Mackenzie[8] found that the serum of blood taken from cases of carcinoma not only has an increased antitryptic value, but can accelerate the action of pancreatic lipase far more than normal serum. These two reactions must be present before a diagnosis of carcinoma can be accepted. The same writer suggests that the treatment of cancer should consist in applying substances which can increase lipolytic or lipoclastic action. The method of estimating the latter is by determining the amount of deci-normal potash required for the neutralization of the fatty acid set free by pancreatic lipase acting on olive-oil emulsion (1·37° for eighteen hours). The indicator is phenolphthalein.

An elaboration of the *complement-binding* method by v. Dungern[9] gives only equivocal results; the technique is difficult, and the time-consumption long.

The *Anaphylaxis Reaction* was admitted by Pfeiffer and Finsterer, but was not corroborated by Rinzi, Elias, Kelling, and others. Researches by Wassermann and Keysser showed that the anaphylactic shock could be produced by inorganic colloids.

The only remaining reactions available for the diagnosis of cancer by examination of the blood serum are the *Freund-Kaminer* and the *meiostagmin*. It has been already pointed out that these are as unreliable as all the others.

Urine.—The observations of Salomon and Saxl[10] have shown that some substance containing *neutral sulphur* occurs in the urine of 15 per cent (five in forty-one) of cancer patients and is absent from 94 per cent (seventeen in eighteen) of persons suffering from diseases other than cancer. [It should be admitted that those non-cancerous cases which gave a positive reaction had a doubtful diagnosis of cancer.—O. G.]. All forms of cancer appear to give the reaction, which depends on the detection of a substance whose sulphur can be split off by such a mild oxidizing agent as hydrogen peroxide, and recognized in the form of barium sulphate. One hundred and fifty c.c. of albumin-free urine are diluted with 100 c.c. of water, and treated with 150 c.c. of barium salt (Salkowski's solution). Filter, and treat 300 c.c. of filtrate with 30 c.c. of strong hydrochloric acid. Boil on asbestos for a quarter of an hour and leave on the water-bath until the precipitate has separated. Filter. Heat 200 c.c. of filtrate with

3 c.c. of hydrogen peroxide for a quarter of an hour. Pour into a conical glass, and a precipitate of barium sulphate will appear in from four to seven hours (not later) if the case is positive.

The utility of an estimation of the *quantity of urorosein in the urine* for detecting gastro-intestinal cancer has been demonstrated by Weiss and Smiecinszewski.[11] These authors found that the chromogen of urine is present only in traces in the normal urine, but is increased wherever there is stagnation of the contents of the intestine. In cancer of the digestive tract, apart from evident stagnation, there is a definitely increased urorosein output. The *method of estimation* is as follows: 25 c.c. of urine is decolorized with lead acetate. Filter, and add 5 c.c. of hydrochloric acid (concentrated). Filter, and add 3 drops of $\frac{1}{2}$ per cent sodium nitrite. Extract the colouring matter with 1 c.c. of amyl-alcohol. This extract is diluted until the spectrum of urorosein may be still seen in a thickness of 17 mm., that is, through a test-tube of that thickness. The number of c.c. of amyl-alcohol necessary for this purpose is the measure of the urorosein present.

Extensive study of the urine of cancer patients by Caforio[12] has shown that an *increase of colloidal nitrogen* is not a specific sign of cancer (epithelioma); it is frequent in tuberculosis and liver disease. On the other hand, there is normally no increase in the content of colloidal nitrogen. The test is therefore of value only when the result is negative.

The method consists in evaporating 100 c.c. of urine to a syrup on a sand-bath; add an equal volume of absolute alcohol. The white powder precipitate is collected in twelve to twenty-four hours, washed in alcohol, and dissolved in water. A Kjeldahl analysis is done and comparison made with the total nitrogen of the urine. In normal urine the percentage in the alcoholic extract is 3·23 per cent. In pathological conditions it rises to 8·28 per cent.

References.—[1]*Amer. Jour. Med. Sci.* 1911, 852; [2]*Berl. klin. Woch.* 1911, 1716; [3]*Giorn. d. Acad. d. Med. di Torino,* 1910, 1911; [4]*Münch. med. Woch.* 1911, 1643; [5]*Berl. klin. Woch.* 1911, 1748; [6]*Wien. klin. Woch.* 1911, 1759; [7]*Münch. med. Woch.* 1911, 2207; [8]*Med. Press and Circ.* 1912, i, 643; [9]*Münch. med. Woch.* 1911, 66, 1093; [10]*Deut. med. Woch.* 1912, 53; [11]*Wien. klin. Woch.* 1911, 1791; [12]*Berl. klin. Woch.* 1911, 1843.

CARBUNCLE.

(*Vol.* 1912, pp. 16, 487)—Application of pure **Glycerin,** by means of lint or Gamgee tissue covered by gutta-percha, has proved useful; so also has the use of **Vaccines.**

CARDIAC SYPHILIS.

Carey Coombs, M.D., M.R.C.P.

Etiology.—That the heart is often attacked, more especially through the aorta and its coronary branches, by syphilitic infection, is becoming well known. Breitmann[1] thinks there is evidence of cardiac injury during the secondary stage, in the shape of arrhythmia, tachycardia and bradycardia, palpitation, dyspnœa, dilatation murmurs, and early, and often transient, aortic incompetence. Warthin[2] has

demonstrated the frequent occurrence of intramyocardial foci of proliferative inflammation and fatty change in the congenital syphilitic infant; while in one of the cases recorded by Cummer and Dexter,[3] that of a congenital syphilitic, death occurred at the age of ten from symptoms identical with those of the adult aortitic type of cardiac syphilis.

However, as the same writers say, it is usually late after the disappearance of the early manifestations of acquired syphilis, that cardiac symptoms arrive. These are, further, not infrequently contemporaneous with parasyphilitic disease of the central nervous system, much more often with tabes dorsalis than with general paralysis, as the figures of Laroche and Richet[4] show.

Pathology.—Brooks's[5] systematic post-mortem study of syphilitic hearts showed that the chief lesions are aortitis, sclerosis of the aortic valves, coronary arteritis, and changes in the myocardium (fibrosis, either dystrophic or post-inflammatory, fatty change, brown atrophy, rarely gumma). Breitmann thinks these lesions are especially found in connection with the conducting system of the heart. The other valves are far less frequently affected. The visceral pericardium shows pearly patches of endothelial and subendothelial proliferation, especially at points of coronary anastomosis; the parietal layer is unaffected.

The lesions which Warthin has found in the hearts of congenital syphilis in infancy are myocardial. There are spots of interstitial proliferation, and fatty change, either focal or diffuse, in the muscle cells. Spirochætes are found in the inflammatory foci, and also in hearts showing diffuse fatty metamorphosis but no reactive phenomena.

Diagnosis.—Breitmann says that angina in a person under fifty without arteriosclerosis or hypertrophy of the left ventricle, practically always indicates cardiac syphilis. Sudden cardiac breakdown, in the absence of fever or valvular disease, is also highly suggestive. Again, the existence of left ventricular hypertrophy without valvular lesion or high blood-pressure to account for it, should arouse suspicion of a syphilitic origin. Of course the presence of other syphilitic lesions, e.g., locomotor ataxy, will often throw light on the nature of obscure cardiac pain. Most strongly suggestive of all, however, are signs of aortic dilatation and of aortic incompetence. A ringing second sound at and immediately above the aortic area, in the absence of high arterial tension, is almost pathognomonic of syphilis; it is nearly always a sign of aortic dilatation, and if the *x*-ray examination confirms this interpretation, the case should be regarded as one of syphilis, whether the dilatation be diffuse or aneurysmal. In all suspected cases the Wassermann test should be applied; this is, according to Breitmann, Cummer and Dexter, Orkin,[6] and Oigaard,[7] the most valuable means of discovering the syphilitic origin of cardiac disease. Cummer and Dexter go so far as to say that even if the patient be the subject of rheumatic infection, a positive Wassermann reaction indicates antisyphilitic treatment.

Treatment.—The principal indications are to attack the causal infection, to remedy the damage already done, and to prevent aggravation of the existing lesions. This latter indication is met by limiting the cardiac burden by prohibition of heavy work, etc.

The lesions already established may no doubt be ameliorated to some extent by the use of **Iodine** preparations. Breitmann gives **Sodium Iodide** in rising doses (from gr. 15 to 150 per diem) with an equal quantity of **Sodium Citrate,** or with **Iron** (**Glycerophosphate** or **Ammonio-Citrate**); or injections of **Tiodine,** one or two ampoules daily. Vaquez and Laubry[8] recommend **Lipiodol** injections.

All writers nowadays agree, however, that the most helpful line of attack is that directed against the spirochæte itself; and nearly all are agreed that **Mercury** is the drug to be used, since it is as efficacious as, and at the same time safer than, the arsenical preparations. Oigaard recommends the inunction method; if the patient refuses this he gives the drug by mouth in a mixture of mercuric and sodium iodides. Vaquez and Laubry favour intravenous injection of the cyanide salt. Goldscheider[9] says that albuminuria does not contra-indicate mercurial treatment, though it imposes the need of extra caution in its use.

Injection of **Salvarsan** was at first shunned altogether in persons with cardiac syphilis. Now, however, there are those who recommend it under certain conditions. Orkin quotes Weintraud as having used it in twenty-six cases of cardiac syphilis without any ill effect. Breitmann says it is contraindicated when the heart is the site of advanced lesions (gummata, aortitis); or in the presence of other cardiac infections such as rheumatism, of non-syphilitic degeneration of the myocardium, or of broken compensation. He further says it should not be given to patients with parasyphilitic disease of the nervous system; and he advocates the use of small doses. Vaquez and Laubry restrict its employment to cases refractory to mercurial treatment. They give series of three doses each, the dose being ·2 cgram.

As to the duration of specific treatment, Oigaard says that mercury should be given till the symptoms are gone and the Wassermann has become negative, remaining so for three weeks after cessation of treatment. Goldscheider says that as relapse and recurrence are likely, the utmost watchfulness must be exercised over patients who have ceased to receive treatment.

References. [1]*Berl. klin. Woch.* 1911, 1763; [2]*Jour. Amer. Med. Assoc.* 1912, i, 409; [3]*Ibid.* ii, 419; [4]*Rev. Neurol.* (*Brit. Med. Jour.* Epit. 1912, ii, 29); [5]*Med. Rec.* 1912, i, 351; [6]*Berl. klin. Woch.* 1912, 1177; [7]*Zeitschr. f. klin. Med.* lxxiii. 5 and 6 (*Wien. klin. Woch.* 1912, 171); [8]*Presse Méd.* 1912, 529; [9]*Ibid.* 697.

CATARACT. *A. Hugh Thompson, M.D.*

Intracapsular Extraction.—The controversy about the "Indian Smith" operation continues, but few have been bold enough to adopt it outside the circle of Smith's own pupils (which, however, is doubtless continually enlarging). One of these—Strother Smith,[1] of Rawalpindi,

writes :—" It is very unfair to the method, and to the patient, for any surgeon to attempt it without having been previously taught by an expert, and also without first having obtained a competent assistant," and the author of the operation himself quotes[2] with approval the following *obiter dictum* of a colleague : " Intracapsular extraction of cataract is destined to be the operation of election. I can see the time coming when extraction of cataract will become a speciality within that of ophthalmology, and that it will be limited to a few men." Most ophthalmologists will feel that when this time does come they may as well retire, and meantime the general opinion is that though the usual operation does not give such a brilliant result as a wholly successful intracapsular extraction, it is safer on the whole, and therefore from the patient's point of view decidedly to be preferred.

Preparatory Capsulotomy.—The chief practical disadvantage of the old operation is that it so often involves a weary waiting for the patient while his cataract is becoming mature. Methods of artificial maturation have not hitherto been conspicuously successful, but a device for dealing with these cases, recently advocated by Homer Smith,[3] deserves a good deal of attention. It consists in performing a capsulotomy from six to twenty-four hours prior to the extraction of the cataract, the result being that clear cortical substance comes away far more easily than if the capsulotomy is performed immediately before the extraction. The procedure also favours a fairly correct judgment of the size of the hard nucleus and, consequently, adaptation of the size of the corneo-scleral section to it.

Homer Smith uses a small Knapp knife-needle for the capsulotomy, and makes a crucial incision into the capsule and subjacent lens substance. " If the cut in the capsule is practically invisible, a large nucleus is present, and the usual section of the upper two-fifths of the cornea will be required for the easy exit of the lens. If semi-gelatinous lens-matter escapes, a section of one-third will suffice, while if a milky liquid issues, the cataract is hypermature and the section may be made with the angular keratome. A period of waiting between the capsulotomy and extraction is required for the anterior chamber to re-form completely, as there is usually sufficient loss of aqueous to render the eye soft and unsuitable for good section. This loss of time is really a gain in results, for even in four hours there is sufficient imbibition of aqueous to facilitate the separation between cortex and capsule and the delivery of the lens."

The crucial incision into the capsule is in the mid-pupillary space, and Homer Smith finds that as the four corners retract so as to leave no capsule in the centre, a subsequent needling is rarely required. Fridenberg[4] has adopted Homer Smith's procedure, but prefers to make a linear peripheral incision into the capsule, which allows of an entire piece of its central portion being removed with capsule forceps immediately prior to the extraction.

Treatment of the Early Stages of Senile Cataract.—Henry Smith,[5] to whose operation of intracapsular extraction reference has already been

made, claims that the vision of those affected with incipient cataract can be improved by **Subconjunctival Injection** of a solution of **Cyanide of Mercury.** The strength recommended is 1–4000, of which 20 min. are injected. There is considerable pain lasting three or four hours, which is not counteracted by cocaine, so that Smith recommends light chloroform anæsthesia and a hypodermic of at least gr. $\frac{1}{3}$ of morphia. [A 1 per cent solution of **Acoine** is more efficient than cocaine, and can be sterilized by boiling and injected along with the cyanide solution. (*See* EYE, GENERAL THERAPEUTICS OF.)—A. H. T.] Smith relates eight cases of early cataract in all of which sight was distinctly improved after one or two injections. The eye looks exceedingly ugly for several days after an injection, but improvement of sight is said to go on for a month. It is too early to say how long it may last.

Galvanism is mentioned on *page* 76 in the treatment of immature cataract.

Cataract and Hook-Worm Disease.—Calhoun,[6] of Atlanta, Georgia, has seen several cases in which young patients infected with *Ankylostoma duodenale* have developed cataracts, and he has no doubt that there is a causal connection between the two. As is well known, infection by this parasite causes a form of pernicious anæmia, and previous observers have noted the occurrence of retinal hæmorrhages in some cases, and optic neuritis in others. Presumably a toxin is produced by hook-worm disease, and the cataract is secondary to toxic changes in the fluid from which the lens obtains its nourishment.

The *treatment* of hook-worm disease consists in the administration of **Calomel** or **Oil** as a purge, followed later by a saline, and then by **Thymol,** either in three doses of gr. 10 to 30 at intervals of an hour, or in a larger dose of gr. 60, followed by another saline to cleanse the bowel of the dead worms. Toxic amblyopia from thymol has been observed, but whether permanent or temporary is not stated.

REFERENCES.—[1]*Edin. Med. Jour.* 1912, ii, 339; [2]*Ind. Med. Gaz.* 1912, ii, 342; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 1065; [4]*Ibid.*; [5]*Lancet*, 1912, i, 1056; [6]*Jour. Amer. Med. Assoc.* 1912, ii, 1075.

CEREBRAL HÆMORRHAGE.

For value of **Venesection,** *see page* 49; **Galvanism** is recommended for the after-effects (*page* 76).

CEREBRAL TUMOURS. (*See* BRAIN, SURGERY OF, *and* VISUAL DEFECTS.)

CEREBROSPINAL FEVER. *E. W. Goodall, M.D.*

Cumpston[1] gives an account of an outbreak of meningitis at Perth, Western Australia, during January to July, 1911. The outstanding features of the cases were: rapid onset, severe attack, and high death-rate; attitude in all characteristic of cerebral irritation, sometimes opisthotonus; definite cervical rigidity, sometimes head-retraction; left facial paralysis, with unequal pupils and left squint; distinct irritability, with marked objection to being moved, and the meningitic cry. During these months an acute disease resembling,

and indeed diagnosed as, influenza, was also prevalent. But bacteriological examination of several cases showed, not the influenza bacillus, but *Micrococcus catarrhalis*. In the only two of the meningitis cases in which the cerebrospinal fluid was bacteriologically examined, this organism was obtained. The author suggests that both the so-called influenza and the meningitis cases were due to this organism, and compares the outbreak with that which occurred in Hertfordshire in 1904 and 1905, and was described by Dunn and Gordon.

TREATMENT.—A new method of administering **Anti-meningococcic Serum** is advocated by Sophian,[2] as a result of his experience in an epidemic of cerebrospinal fever at Dallas, in Texas. The usual practice is to inject into the spinal canal a volume of serum equal to, or slightly less than, the amount of cerebrospinal fluid removed by lumbar puncture. But sometimes, immediately or a few hours after the injection, severe symptoms have been observed to arise, which though usually attributed to the disease, are, according to Sophian, due to the injection. Hence he sought for some safer guide to the amount that might be injected. It occurred to him at first that determination of the pressure of the cerebrospinal fluid during lumbar puncture would furnish the desired indication. After withdrawing such a quantity of cerebrospinal fluid as reduced the pressure to normal, he attempted to inject antimeningococcic serum in sufficient quantity to raise the pressure to what it was before the removal of the fluid. He found, however, that the results thus obtained were not only misleading but dangerous. He could inject even larger quantities of serum than of the fluid withdrawn without bringing the pressure up to its original height, and in some cases serious symptoms arose. This method was therefore abandoned, and recourse had to a study of the *blood-pressure* during lumbar puncture. After observations in about 200 cases of cerebrospinal fever, and from 500 to 700 punctures, the author states that he has found almost uniform results in blood-pressure change on injecting serum.

The effect on the blood-pressure of withdrawing fluid by lumbar puncture in meningitis is inconstant. Most often there is a drop, occasionally quite large, especially on the withdrawal of large quantities of fluid. In practice the author stops the withdrawal of cerebrospinal fluid when the blood-pressure has fallen 10 mm. in an adult, and 5 mm. in a child. In some cases "there is no change in blood-pressure, or there may even be a rise, on removing fluid; one can withdraw as much fluid as possible, usually till the cerebrospinal-fluid pressure is normal, this being roughly measured by counting the drops of fluid as they flow from the needle; one drop of fluid every three to five seconds corresponds roughly to a normal pressure."

The serum, previously warmed to body temperature, should be injected slowly, preferably by the force of gravity. As a rule, as soon as the injection is begun, the blood-pressure drops, and continues to drop steadily. After a total drop of 20 mm. in an adult with average blood-pressure of 110 to 120 mm., the injection should be stopped.

Sometimes there is a temporary, rarely a permanent, rise of blood-pressure on the injection.

The author states that since he began using this method the average dose of serum has become considerably smaller, 20 to 25 c.c. in adults, and less in children. When the blood-pressure has allowed, he has injected as much as 30 to 40 c.c., seldom more. He thinks it is very rarely necessary or beneficial to inject more than the maximum of 40 c.c. of serum. The method is of especial value (as to dosage) in atypical cases, especially when the fluid is too thick to flow through the needle.

The clinical symptoms associated with a fall in blood-pressure are as follows, in the order of their appearance: stupor, which deepens as the pressure falls; shallow and irregular, at times deep, stertorous, and slow respiration (with a large drop in pressure, breathing may stop suddenly); dilatation of the pupils; incontinence of fæces and urine. "The pulse will often continue good, even with a large drop in blood-pressure, and even with marked change in the breathing; at times it becomes slow and irregular, and is therefore very often misleading."

If these symptoms occur during the injection of serum, this should be stopped at once, and fluid be removed from the spinal canal. If the injection is being performed by the gravity method, this is easily done by lowering the funnel through which the serum is being introduced. **Epinephrin** in large doses should be injected into the muscles.

Sophian states that in his experience a general anæsthetic during lumbar puncture and injection of serum is dangerous, and should be used only when absolutely necessary in violent patients. He also writes as follows: "I have found that giving many patients water through a straw will keep them quiet; even delirious adults will reflexly suck on the straw and quickly become quiet. During the operation the patient will sometimes drink as much as nine or ten glasses of water. It acts especially well with children; I have referred to it as 'water anæsthesia.'" The author states that the *mortality* of the 185 cases treated by the method detailed above has been about 25 per cent, and promises a further communication.

In his Cameron Prize Lecture, Flexner[3] gives an interesting and succinct account of the invention and application of **Anti-meningococcic Serum.** When first used it was given hypodermically, but it was soon found that given in this way it was of no value. This result and the knowledge of the fact that "the meninges are highly impermeable to extraneous substances, and even to the normal protein and other constituents of the blood," led to the experimental subdural injection of the serum in monkeys artificially infected with the disease. The results were most promising, and the next step, to attain which the experiments had been undertaken, the application of the method to the human subject, has been very satisfactory.

The serum prepared at the Rockefeller Institute (Flexner's laboratories) was supplied to hospitals wherever cerebrospinal fever was epidemic; and as the disease was at that time (1907 to 1909) very

widespread, it was used in the United States, France, Belgium, Switzerland, Denmark, Germany, Greece, Africa, India, Australia, South America, and Palestine. Details of the cases treated were sent to Flexner, and from them the following statistics were prepared.

Of 1295 serum-treated cases of proved epidemic meningitis, 893 recovered and 402 died, a fatality of 31 per cent. The fatality of cases not so treated is never lower than 70 per cent, usually 80 to 90. The influence of the period of the disease at which the specific treatment was begun, is shown by the following table of 1211 cases whose histories were sufficiently detailed to determine this period :—

Period of Disease.	Total Cases.	Mortality per cent.
Within first three days	199	18
Fourth to seventh day	346	27
Later than seventh day	666	36

On these results the author remarks that the first two groups are fairly homogenous, while the last is made up of cases not a few of which are in a semi-chronic or chronic condition, and thus in the main quite hopeless.

The fatality amongst infants under two years of age is usually very high, being rarely lower than 90 per cent. Hence an analysis of these cases is instructive. Of 125 infants under one year, of which sufficient details were furnished, 63 recovered and 62 died. Of 21 infants injected within the first seven days, 17 recovered and 4 died, a fatality of less than 20 per cent. On the other hand, of 104 cases which came under treatment after the seventh day, 46 recovered, a fatality of nearly 56 per cent. The fatality rate in children of two to five years was 15 per cent ; those injected within the first week, 10 per cent ; after the first week, 20 per cent.

In dealing with the figures relating to the patients of twenty years old and upwards, of whom there were 263, with 103 deaths, a fatality of 39 per cent, the author asks the question : Are adults less subject to the serum, or do they have a more highly mortal form of the infection ? The answer to this he finds to be that adults do furnish a larger number of the so-called explosive or fulminant examples of meningitis than children ; and it is these fulminant cases that are so resistant to treatment. Children show a greater spontaneous tendency to recover than adults. " Young children rarely succumb to the highly acute infection ; they tend rather to succumb to chronic infection, superinduced often by the dissociation of the spinal membranes and the ventricles of the brain."

Whereas natural recovery in epidemic meningitis is gradual, in the serum-treated cases recovery by crisis was not uncommon. The duration of the illness was shorter in these cases than in those not treated with serum, being eleven days on the average, as compared with four weeks. Lastly, the number of permanent sequels among the serum-treated cases is much smaller than amongst those not so

treated. The only serious complication noted has been deafness, partial or complete.

Flexner believes the results of the intraspinal and cerebral method of treating cerebrospinal fever ought to encourage us to search for similar methods and hope for favourable results in other diseases of a like nature, such as influenzal and pneumococcic meningitis. For these expectations he has found support in his experiments on monkeys. So far the methods have not been applied clinically in these diseases.

For **Serum** treatment, *see also page* 40.

Prophylaxis.—Sophian and Black[4] give a detailed account of the **Vaccination** of eleven adults (students) against cerebrospinal fever. The vaccine was made from a coccus in about the fifth generation, from one obtained from the cerebrospinal fluid of a patient.

The inoculations were made just below the deltoid. Five persons received 500,000 [thus in the paper, but from the context 500 million seems to be meant.—E. W. G.] cocci as the first dose, and five were injected with 1000 million. Seven days later they received the same vaccine in doses of 1000 million and 2000 million respectively. A week later they were vaccinated a third time with 2000 million of a freshly prepared vaccine. The following is a summary of results: There is a leucocytosis for a few days following vaccination; there is a prompt response in the formation of immune bodies, which appear four days after the first vaccination and increase rapidly after the repeated injections; agglutinins develop in larger quantities and more rapidly than the third order of immune body, agglutination being obtained at 1–2,500 dilution, in some cases, at the end of three weeks; by complement fixation one could obtain sharp fixation at 1–200 at the end of the third week, this being a high degree of immunity. Apparently the very large doses did not produce much higher immunity than the smaller doses used; three injections appeared to give desirable results: the doses of 500 million, 1,000 million, 1,000 million, would seem to be sufficient; all of the vaccinated students responded, though No. 10 did not develop a very high degree of immunity. About four hours after an injection a local inflammatory reaction takes place, and this is more marked after the second injection. In some cases there is also a general febrile reaction lasting for about twenty-four hours. Labial herpes occasionally occurs.

References.—[1]*Austral. Med. Gaz.* 1912, i, 7; [2]*Jour. Amer. Med. Assoc.* 1912, i, 843; [3]*Edin. Med. Jour.* 1912, i, 389; [4]*Jour. Amer. Med. Assoc.* 1912, ii, 527.

CERVICAL ADENITIS.

(*Vol.* 1912, p. 60)—A careful investigation by Waugh showed that in treating tuberculous glands in the neck, removal of foci of irritation (infected tonsils, carious teeth, etc.) is of more importance than the use of tuberculin.

CHANCROID. *C. F. Marshall, M.D.*

Ramazzotti[1] reports a case of *extragenital chancroid.* The patient, a youth of seventeen, contracted a chancroid of the penis which was followed in two weeks by two small ulcers, one on the finger and one

on the leg. The bacillus of Ducrey was present in both ulcers, and both were probably due to auto-inoculation. Extragenital chancroids owe their alleged rarity to their unusual localization, by which they escape diagnosis. They are most frequent on the fingers, but may occur on the abdomen, head, breast, and limbs.

Reference.—[1]*Giorn. delle Mal. Ven.* etc. 1911, July 12.

CHLOROSIS.

For treatment by administration of **Prothæmin,** *see page* 34.

CHOLANGITIS.

(*Vol.* 1912, p. 18)—Chauffard obtained excellent results in acute infective cases by small doses (10 gr. daily) of **Urotropin.**

CHOLERA. *Leonard Rogers, M.D., F.R.C.P.*

Cholera continued to be prevalent in Europe during the summer of 1911 and, although mild in Russia and limited to the Volga and Caucasian provinces, broke out severely in Constantinople and was widespread in Italy, and especially in Sicily, while a few cases were reported from Austria and Marseilles. Asia Minor, Syria, and Arabia were also affected.

Treatment.—L. Rogers[1] reported the results of a visit to Palermo, where he was allowed by the Italian authorities to demonstrate his treatment by **Hypertonic Salines** intravenously, and **Potassium Permanganate** by the mouth. A considerable reduction in the mortality was obtained, and after he had left, the Italian doctors reported to him further favourable results. His experience at Palermo led him to the conclusion that the hypertonic injections should be given even earlier and more frequently than he had previously advised; namely, whenever the specific gravity of the blood was found to have risen to 1063 or over, without waiting for collapse to ensue, as indicated by a very low blood-pressure. By this means the collapse stage could often be anticipated and prevented, greatly to the benefit of the patient. In children, he found the use of subcutaneous hypertonic saline of great benefit; while if serious collapse was present, intravenous injections could be given with great advantage by means of a fine cannula improvised by drawing out a piece of glass tubing to a small calibre.

The same writer,[2] in a further paper, deals with the value of estimations of the specific gravity of the blood by means of a series of small bottles of glycerin and water of different degrees of concentration (Lloyd-Jones's method), and gives rules for guidance as to the amount of fluid to be used in different stages of the disease. In the collapse stage, he advises administration of three pints of the hypertonic solution intravenously, if the specific gravity is 1063; while if it is over 1065, as much as five pints may be injected in an adult male. In the later stages of deficient urinary excretion, during the reaction stage, a slow isotonic intravenous injection is used if the specific gravity is over 1060, and a subcutaneous one if it is below that point, the blood being diluted down to about 1050. He was led to use subcutaneous

injections more largely than before by their successful employment by the Italian doctors at Palermo in this stage of the disease.

T. H. Bishop[3] records a new method of intraperitoneal administration of Rogers' hypertonic solution in cholera at the Lower Ganges Bridge works, where it was not always possible to carry out the intravenous method. A spot just below and to one side of the navel is sterilized by a drop of pure carbolic acid, and the tissues being supported on either side and drawn taut, a sterile trocar-cannula is boldly thrust through the abdominal wall, a piece of rubber tubing is attached to the cannula, and warm hypertonic saline run in at the rate of about a pint in four or five minutes, three to five pints being injected at one time. Of fourteen severe cases thus treated only one died, so a further trial is recommended where the conditions are suitable, as assistant surgeons can be very easily taught to carry out this simple measure with success.

L. Gunguly[4] reports the results obtained by the hypertonic saline and permanganate treatment at the Campbell Hospital, Calcutta. Among 184 cases, no less than 78 per cent of whom were admitted in a totally collapsed condition with no radial pulse, 58·6 per cent recovered —a very good record. In about 10 per cent of the cases no amount of fluid would raise the blood-pressure above 70 to 80 mm., hopeless vasomotor paralysis being present, while in others repeated collapse occurred with a fatal result. Uræmia was the most difficult condition to deal with, and it not infrequently ended fatally in spite of the blood-pressure remaining at from 110 to 115, especially if any urine passed had a specific gravity below 1010. Most of the fatalities occurred in patients admitted at a late stage of the disease.

Etiology.—R. H. Creel[5] records the case of a cholera carrier seen at New York, in whose stools comma bacilli were found intermittently, so that if they had not been sought for repeatedly the condition would have been overlooked and might have started an outbreak of the disease. Marked constipation was present, and the organisms were found only after a purge had been given. The usual peptone medium was inoculated with the stools, subcultured in a second flask after six hours, and finally plated on agar. A. Weibkopf[6] writes on a new bacteriological method for the diagnosis of cholera. He confirms the value of Dieudonné's blood-alkali-agar medium for the detection of the cholera vibrio. He finds Ottolenghi's alkaline bile medium (fresh ox bile 100 c.c., sodium carbonate 10 per cent, 3 c.c., and potassium nitrate 0·1 per cent, 3 c.c.) a better enriching method than the usual peptone water. He therefore inoculates the latter from the stools, and after about six hours at 37° C. he subcultures on Dieudonné's medium and tests the colonies in the usual way with a strongly agglutinating serum. M. Gioseffi[7] records a case in Italy in which a bacteriological examination during life was negative, but post mortem it was positive.

References.—[1]*Brit. Med. Jour.* 1911, Nov. 18; [2]*Ind. Med. Gaz.* 1912, April; [3]*Ibid.*; [4]*Ibid.*; [5]*Jour. Amer. Med. Assoc.* 1912, i, 187; [6]*Wien. klin. Woch.* 1911, 1185; [7]*Gaz. Deg. Osp.* 1912, 84.

CHOREA. (*See also* RHEUMATISM.)

Frederick Langmead, M.D., M.R.C.P.

ETIOLOGY. — Most English authors are agreed as to the close relationship between chorea and *rheumatism*, the trend of opinion being to regard it as one of the many manifestations of that disease. M. S. Fraser[1] has contributed an interesting paper which helps to confirm this belief, based on all the cases of chorea admitted to Paddington Green Children's Hospital for the last decade, 300 in all.

Definite evidence of rheumatism before the attack of chorea was obtained in 150 cases, or 50 per cent. Twenty-four (8 per cent) showed rheumatic manifestations during the attack, and of these nine (3 per cent) had no history of previous rheumatism, bringing the total of definitely rheumatic children up to 53 per cent. Cardiac disease was noted in 189 cases, or 63 per cent ; of these, in 4 per cent the heart was enlarged without a murmur being heard, in 47·3 per cent a mitral systolic murmur was present, in 8 per cent a double mitral murmur, and in 3·7 per cent other cardiac affections ; 2 per cent had pericarditis also. Taking a double mitral murmur as incontrovertible evidence of rheumatism, he found that 3 per cent having this sign had no other evidence of rheumatism previously to, or concurrently with, the chorea. These, with the 53 per cent already considered as definitely rheumatic, bring the total to 56 per cent. If those with a systolic murmur are added, the percentage of choreic children who were also rheumatic amounts to 74. No doubt still more would be included if the cases were followed up subsequently, for F. E. Batten has shown that at least 25 per cent of those who at the time of their stay in the hospital show no sign of rheumatism, develop it within six years. A *family history* of rheumatism was obtained in 44 per cent, of chorea in 14 per cent, and of both in 8·6 per cent. If cardiac systolic mitral murmurs be taken as evidence of rheumatism, then out of the 300 cases of chorea 270, or 90 per cent, had either a personal or a family history of rheumatism.

An investigation into the correspondence between the *age and seasonal incidence* of chorea and rheumatism respectively, showed that it was very close.

He regards a *neuropathic* tendency as an important factor in the etiology of chorea, as shown by the sex incidence, the frequency of a neuropathic family history, and the occurrence of fright and other emotional disturbances before the onset of the attack. The sex incidence agrees closely with that recorded by other observers, and was in the proportion of 2·7 females to 1 male. A definite history of fright preceding the attack of chorea was found in thirty-six cases, or 12 per cent, of which only 5·3 per cent had not also evidence of rheumatism, either personal or in the family. S. F. A. Charles,[2] on the other hand, combats the view that chorea is rheumatic, believing that the toxins in each case are different, but that a rheumatic diathesis is conducive to chorea. He thinks it untenable that the same toxins which give rise to the serious cardiac lesions

and joint conditions of rheumatism, could produce such a disturbance of the highly sensitive cells of the brain without showing any trace of permanent injury. He quotes MacAlister as showing that the plasma in the two diseases reacts differently to normal leucocytes.

Gordon[3] compares acute chorea with acute poliomyelitis, and thinks that like the latter, it is due to some infection, the motor cells being irritated instead of destroyed, and so causing movements instead of paralysis. He quotes Hudovernig, who has found marked vascular changes in the central nervous system in chorea, consisting of dilatation of the capillaries, perivascular infiltration with round cells, and œdema. Degenerative changes are found in the cortical cells, and vacuolation in the cells of the cornu Ammonis. There are also slight ependymitis, and leptomeningitis. (These changes correspond closely to those already described by Poynton and Gordon Holmes who, however, particularized no changes in the cornu Ammonis.) A large number of special corpuscular bodies are disseminated around the blood-vessels, especially in the medulla and pons, which by exciting the pyramidal tracts may produce the choreic movements.

Symptoms.—Marfan[4] has noted that *diadokokinesis* is invariably disturbed, and in a marked and lasting manner. If the patient is told to put her forearms in the upright position, with the hands up, and to make rapid alternate movements of pronation and supination, the following features are discernible. Whilst this can be done fairly regularly and quickly on the side least affected, on the other side two or three irregular movements are made, and then movement stops.

The sign appears early, lasts throughout the attack, and persists for a longer or shorter period after other manifestations have disappeared. As tested by this sign, chorea lasts much longer than the classical signs indicate, often for months, during which there are periods of amelioration and aggravation. As long as it is detectable, a relapse may occur, and the patient cannot be pronounced well until it has disappeared.

Richardière, Lemaire, and Sourdel[5] noted that *examination of the cerebrospinal fluid* revealed a marked lymphocytosis, a feature which was more constant than many of the usual signs.

Treatment.—A certain astute physician once made the very pertinent apophthegm that one of the worst dangers of chorea is its treatment. Most drugs have been employed against it at some time or other. Recently the list of treatments has been further augmented. S. F. A. Charles advises the use of **Trional,** claiming that it controls the movements, produces sleep, and rapidly effects a cure in most cases. He gives as much as gr. 10 every two hours until at least seven hours' continuous sleep are obtained; 330 gr. of trional were given in one case. [Hæmatoporphyrinuria has been produced by much smaller doses; no mention is made of any examination of the urine.—F. L.] Emile Sergent and Besset[6] report the case of a boy suffering from pronounced paralytic chorea, and so much asthenia

as to suggest suprarenal insufficiency. **Suprarenal Extract** was tried, and the paralytic symptoms disappeared on the re-appearance of the choreic movements and rise of arterial tension.

Richardière, Lemaire, and Sourdel think, after a limited trial, that **Lumbar Puncture** is free from any special danger and may be beneficial. Rocaz[7] records five cases treated by injections of **Sulphate of Magnesia** into the spinal meninges. The solution used was of a strength of 25 per cent in sterilized water. Twelve c.c. of cerebrospinal fluid having been withdrawn, 2 c.c. of the solution were injected. After the injection the temperature fell below normal, the pulse became slow, and there were facial pallor and general prostration, occasionally vomiting and incontinence. An hour later the legs were paralysed and the choreic movements ceased. After injection of caffeine, the children improved, the pulse rose, and the temperature was slightly above normal. The next day they were apparently well and free from choreic movements. A second injection may be necessary five or six days later. Four cases were absolutely and rapidly cured.

Combined Glandular Extracts (*page* 30), and **Ureabromin** (*page* 44) have also been advocated.

REFERENCES.—[1]*Pract.* 1912, i, 461 ; [2]*Dub. Med. Jour.* 1911, ii, 336 ; [3]*Jour. Amer. Med. Assoc,* 1910, ii, 1198 ; (*Brit Jour. Child. Dis.* viii, 517) ; [4]*Soc. de Pediat.* Paris, Bull. No. 3 (*Brit. Jour. Child. Dis.* viii, 268) ; [5]*Ibid.*: [6]*La Clin. Infant.* 1910, 618 (*Brit. Jour. Child. Dis.* viii, 83) ; [7]*Gaz. Hebd. des Sci. Méd. de Bordeaux,* 1911, xxxii, 409 (*Brit. Jour. Child. Dis.* viii, 567).

CLEFT PALATE. *Priestley Leech, M.D., F.R.C.S.*

R. W. Murray[1] is of opinion that Langenbeck's is the best method. Brophy's operation is a severe one, and in his hands has not been very successful. Lane's operation does not give a movable soft palate, and on the mobility of the palate depends the subsequent capacity for clear articulation. If hare-lip and cleft palate co-exist, he prefers to operate on the hare-lip at three months, and on the palate at three years. It is better to operate in the summer months ; the cleft palate season opens on May 1st, and closes on October 1st.

It is important to syringe the mouth and nostrils after the operation, to keep them clean. This should be rehearsed beforehand, since every child will not submit to it. For anæsthetic, Murray uses chloroform given on a piece of lint ; Junker's apparatus, though convenient, is dangerous. The patient lies on the back with the head and shoulders raised, and the operator stands on the right side. He closes the whole cleft at one sitting (*Figs.* 34 to 39 on next page). After paring the edges, he uses a glass syringe with a piece of rubber attached, to clear away the mucus and blood, in place of gauze pads which irritate the raw edges. To evert the edges of the wound and bring the raw surfaces well together, he uses one or two button sutures. Silver wire and fine silkworm gut are used for suturing. In exceptional cases, he surrounds the flaps with tape impregnated with Horsley's wax. Often he washes out the stomach by a tube passed through the nostril.

Langenbeck's Operation for Cleft Palate.

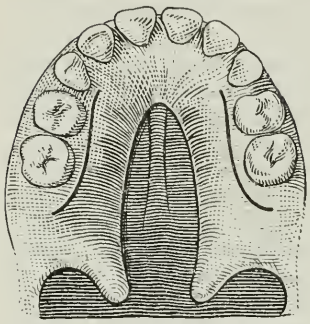


Fig. 34.—Showing the position and extent of the lateral incision.

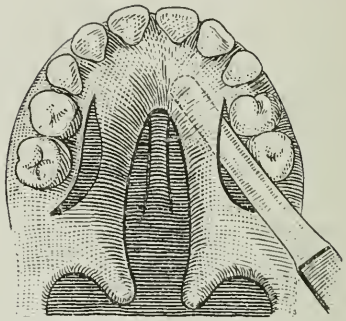


Fig. 35.—Muco-periosteal flap raised well beyond the limit of the cleft.

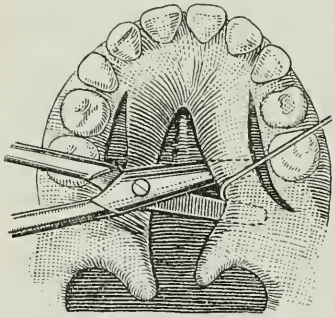


Fig. 36.—Division of the posterior reflection of the soft palate.

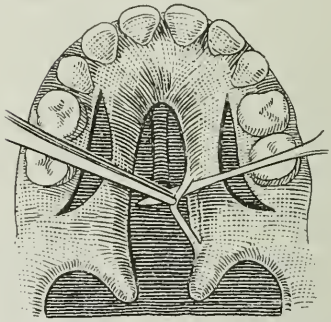


Fig. 37.—Paring the edges of the cleft in order to obtain a broad raw surface.

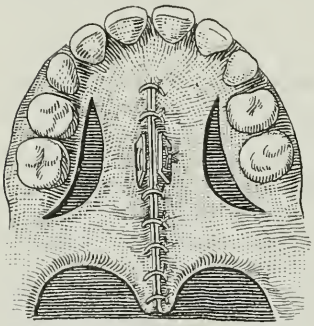


Fig. 38.—Button suture, to evert the edges and bring the surfaces into apposition. Two or more pairs may be used.

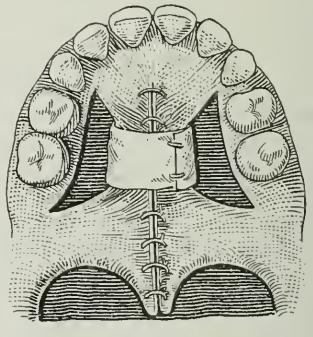


Fig. 39.—Waxed tape used to relieve the tension on sutures (rarely necessary)

PLATE X.

MEMBRANOUS PERICOLITIS

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PLATE XI.

MEMBRANOUS PERICOLITIS

By kind permission of "Annals of Surgery"

PLATE XII.

MEMBRANOUS PERICOLITIS

Showing the method for division of the bands.

By kind permission of "Annals of Surgery

PLATE XIII.

MEMBRANOUS PERICOLITIS

Showing the method of division of the bands.

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The After-Treatment is a matter of nursing. If the child cries, a little nepenthe may be given. In children over four years, nasal feeding may be used for the first week after operation. In ordinary mouth feeding, milk should not be given ; it clings to the stitches, is difficult to wash away, and undergoes fermentative changes. It is better to use Valentine's meat juice, soups, or bovril. Half an hour after each feed, the palate should be syringed with warm water.

J. Berry[2] gives a further list of eighty-one cases of cleft palate treated by operation. He thinks that the best period for a cleft-palate operation is between one and three years of age. It is important to detach the soft from the posterior edge of the hard palate in all but the most trivial cases. He considers that Lane's flap operation gives a very high mortality and is not so successful as Langenbeck's. He has had no death in either series of cases. Lessons in articulation after an operation are essential, if the best results are to be obtained.

Helbing[3] has operated on 100 cases of cleft palate, ninety-eight of them by Langenbeck's method. He does not recommend Brophy's operation, which he has performed twice, and considers Lane's operation difficult. He had one death in the 100 operations.

References.—[1]*Lancet*, 1911, ii, 1466 ; [2]*Brit. Med. Jour.* 1911, ii, 1092 ; [3]*Berl. klin. Woch.* 1912, 980.

COLITIS.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Membranous Pericolitis.—In 1909 there appeared an account by Jackson[1] of a condition affecting the ascending colon, which he thus designated. For a lucid and accurate description of the naked-eye and microscopic appearances of this condition the original paper should be consulted. Although Lane had previously published descriptions of similar adhesions, it was the appearance of Jackson's paper, and a short illustrated article by Crossen,[2] which served to remind surgeons of many hitherto unrecognized cases.

Membranous pericolitis is described by Pilcher[3] as a thin veil-like film generally found covering the cæcum and ascending colon to a greater or less extent (*Plates X, XI*). In some cases, at certain limited areas, a much more positive fibrous proliferation may be present, producing distinct band-like conditions. These may very materially restrict the expansibility of the intestinal walls, or even bind down the wall of the gut at some point so closely as positively to narrow its lumen. Pilcher thinks these membranes are the result of long-continued or oft-repeated mild infections of the peritoneal covering of the cæcum and appendix.

Symptoms.—The *local* symptoms are discomfort and pain, with variable tenderness in the right iliac fossa, often accompanied by colicky cramps significant of paroxysms of muscular spasm. In cases where pericolic bands are present on the left side, binding down the sigmoid and its mesentery to the iliac fossa just above the brim of the

pelvis, visible peristalsis of the coil of pelvis colon just above may occur.

Fæcal stasis results from defective peristalsis or obstruction due to constriction bands or angulations, and this gives rise to the numerous *general* symptoms of auto-intoxication—staining and wrinkling of the skin, excessive sweating, enfeebled circulation with cold extremities, slightly swinging temperature, loss of flesh, muscular degeneration, enteroptosis, dulling of mental faculties, restlessness during the night, headaches, painful joints, and cystic degeneration of the mammæ. The patients usually give a history of having to take increasing doses of aperients to relieve constipation. The fæces are foul smelling and may contain an excess of mucus. Distinct mucous casts even may be passed. **X-ray Examination** after a bismuth meal affords valuable confirmation. Gray and Anderson[4] recommend that the patient be told not to lie down between taking the bismuth meal in the early morning and the *x*-ray examination (in the erect posture) in the evening. These chronic symptoms may at any time become more acute. The "indigestion" becomes more marked, a dragging colicky pain may occur in from one to four hours after food, and there is usually tenderness over the affected part. Even complete obstruction may occur and persist until relieved by operation.

Delore and Alamartine[5] give a good description of membranous pericolitis as a delicate membrane attached to the parietal peritoneum to the outer side of the ascending colon, descending obliquely inwards over the ascending colon and cæcum, and covering them with a fine transparent veil. This membrane is not closely adherent to the intestinal surface, but is separated from it by an œdematous subserous layer. On drawing the cæcum and colon inwards, thickenings of the membrane appear as fibrous bands, which kink and partially obstruct the colon. They place the symptoms and signs in three groups: (1) *Gastro-intestinal*—recurring indigestion, nausea, vomiting, fullness after food, loss of appetite; (2) Signs of *auto-intoxication*—sallow complexion, lassitude, wasting, neurasthenia (these symptoms are more marked when the obstruction is in the ascending rather than the descending colon); (3) Evidence of cæcal stasis—painful attacks of distention with slight obstruction; constipation, with alternating diarrhœa.

Etiology.—The theory which ascribes these membranes and bands to an inflammatory cause, to which Delore and Alamartine subscribe, is rejected by Gray and Anderson for the reason that the lymphatics of the bowel run inwards with the meso-colic vessels, and in these cases there is usually no evidence of thickening, such as might be due to chronic inflammation, along the lymphatics accompanying the meso-colic vessels. These adhesions are also far more regular in their distribution than would be the case if they were of inflammatory origin; and the linear arrangement of vessels in the pericolic membrane does not resemble an inflammatory vascularization. Chronic appendicitis has been invoked as a causative agent of the peritoneal bands in

this neighbourhood ; but the typical ileal band of Lane, and Jackson's pericolic membrane, may be associated with an appendix free from adhesions, and in apparent good health. Neither do they find Lane's explanation—that these bands are the result of crystallization of lines of strain—satisfactory. And they dismiss as an embryological inexactitude the theory put forward by Mayo, that the pericolic membrane may result from the burrowing of the cæcum and lower end of the ileum behind the posterior parietal peritoneum, during their descent from under the liver.

Their belief is that all these adhesions are due to " excess of physiological fusion." According to them, Lane's ileal band is due to the fact that the peritoneum lining the under surface of the lower end of the ileum and its mesentery becomes fused, during the latter part of fœtal life, with the dorsal parietal peritoneum, in a similar fashion to the fusion of the ascending meso-colon. During subsequent development the peritoneum reflected from the iliac fossa to the bowel is partly pulled and partly pushed out in the form of a roughly quadrilateral or triangular membrane. The membrane need not cause symptoms, even when well marked, but at any time owing to sudden, possibly repeated, changes in the intra-abdominal tension, or, on the other hand, to a gradually acquired atonic condition of the bowel, kinking may occur, and more or less gradually give rise to a condition of affairs which becomes chronic.

They consider that Jackson's pericolic membrane is simply the right margin of the omentum which ordinarily reaches as far as the hepatic flexure. Here the omentum, during development, may become adherent to the dorsal parietal peritoneum opposite the flexure and along the outer side of the ascending colon for a varying distance. During the descent of the cæcum, this part of the omentum may become drawn out, usually losing its fat, and the vessels assume a linear parallel arrangement. The lower meso-sigmoid adhesions are to be considered as an excess of the normal physiological fusion of the outer leaf of the meso-colon. Gray and Anderson think these adhesions are not developed secondarily to visceroptosis, as held by Lane, but on the contrary have much to do with the production of this condition.

Treatment.—Most writers agree that the pseudo-peritoneal membranes should be divided until the bowel is free of hindrance. In many cases this will relieve the symptoms. The division of the bands should be done in such a manner as to free the affected part of the bowel, and at the same time cover up any raw surface that may be left (*Plates XII, XIII*). Lane's ileal kink, for example, is to be treated by division of the band at such a distance from the ileum that a flap is formed with which to cover the raw surface on the bowel and mesentery. The denuded area in the iliac fossa may then be covered by sliding the posterior peritoneum over it and suturing. In other cases a free omental flap may be transplanted over the raw surface to prevent the re-formation of adhesions. If numerous secondary

adhesions are encountered, it is probably better practice to perform an ileo-sigmoidostomy, after treating the meso-sigmoid adhesions by plastic methods. Delore and Alamartine advise anastomosis between the cæcum and transverse or ascending colon above the adhesions. They suggest that this will be as efficacious as, though less radical than, Lane's operation of ileo-sigmoidostomy, which may have to be followed by colectomy.

The use of **Calumba-Agar** (*page* 3) in certain types of colitis is referred to. **Ionization** is also recommended for some cases (*page* 72).

References.—[1]*Surg. Gyn. and Obst.* 1909, ii, 278; [2]*Ibid.* 1911, ii, 32; [3]*Ann. Surg.* 1912, i, 1; [4]"Developmental Adhesions affecting the Lower End of the Ileum and Colon,"—*Aberdeen Univ. Press*, 1912; [5]*Rev. de Chir.* 1912, i, 711.

CONJUNCTIVA, DISEASES OF.

John H. Yearsley, M.A., M.R.C.P., F.R.C.S.

Gonococcal Ophthalmia.—A new form of treatment for this disease has been introduced by Goldzieher.[1] **Steam,** issuing from the spout of a kettle of boiling water (fitted with a special nozzle), is allowed to play upon the everted lids and fornices, 4 cm. away. The temperature at this distance is 113° F., and rapidly kills the gonococcus. Although the cornea is protected during the application, there is some pain; this, however, is felt less when the treatment is repeated. In four days the purulent secretion is stopped, and the cornea is safe. If the swelling is too great to permit eversion of the lids, an ice compress is used to reduce it. The author believes that the steam kills the organisms by reaching the deeper epithelial layers, and that the pellicle which forms when silver nitrate is used, while it destroys the microbes on the surface, protects those beneath. Goldzieher omits details as to the number and duration of the *séances*.

Herrenschwand's[2] experiments with **Airol** confirm the good results obtained by Bernheimer, who used it in gonococcic ophthalmia both of infants and adults at the Innsbruck Eye Clinic. Airol is a fine, greyish-green powder, prepared by the Hoffmann-Laroche Co., of Basel. It is a substitute for iodoform, and has the advantages of being odourless, tasteless, and unaffected by light. If moistened, it becomes yellowish-red, and yields up some of its iodine, of which it contains 24 per cent.

Meyerhof[3] mentions some interesting facts about gonococcal conjunctivitis in Egypt. Though the incidence in the summer months is very high, even epidemic, it is not in the hottest period that the greatest number of cases occur, but two months later. He believes, therefore, that the heat of the Egyptian summer favours the growth of the gonococcus away from the human body; though he finds that flies scarcely deserve the high reputation they enjoy as carriers of this disease. Ophthalmia neonatorum is rare in Egypt; and the adults whose conjunctivæ are infected by the gonococcus seldom have a Neisserian urethritis.

He notes that the gonococcus readily attacks the trachomatous

conjunctiva, but that pannus seems to afford a certain amount of protection to the cornea. He agrees with Hirschberg that time ought to have at least as much credit as yellow oxide ointment for the remarkable way in which corneal opacities following ophthalmia often clear up, especially in children.

Trachoma.—The "bodies" of Halberstädter and von Prowazek (*vide* MEDICAL ANNUAL, 1911, pp. 262, 263) have been found on conjunctivæ unaffected by trachoma, and even on the urethral epithelium. The younger Addario reports their presence even on the normal conjunctiva. Casali[4] met with them frequently in chronic and acute trachoma, sometimes in adult and infantile ophthalmia, not at all on the normal conjunctiva, in spring catarrh, Koch-Weeks catarrh, and Morax-Axenfeld conjunctivitis. This discrepancy is unfortunate, and suggests the need of a strictly uniform technique, and of a definite agreement as to what appearances in the microscopic field are "bodies" and what are not. At all events, the *Körperchen* do not possess the specific importance which was at first attached to them by their discoverers.

Examples of *uniocular* trachoma are rare. Benson reported one (*vide* MEDICAL ANNUAL, 1911, p. 263). Meyerhof[5] has found traces of old trachoma in several instances of supposed immunity, and believes that though the one eye may escape for a time, it contracts the disease sooner or later. The same writer quotes examples of *re-infection* with trachoma.

TREATMENT.—Grignolo[6] has used **Copper Sulphate** 2 parts, **Boric Acid** 100 parts, finely powdered and mixed. The infected mucous surfaces are, after cocainization, rubbed with a swab dipped in the mixture, and then flushed with a 1–5000 solution of **Cyanide of Mercury.** The lids are swollen next day, and a pseudo-membrane coats the treated surfaces, but is readily removed by a douche. When the reaction has subsided, **Silver Nitrate** (1 or 2 per cent) is daily brushed over the granulations till the mucosa is smooth. The powder is re-applied if necessary.

Ernest Thomson[7] brushes the anæsthetized surface with freshly prepared **Protargol** (20 per cent).

Lea[8] pricks the granulations with a tattooing needle dipped in strong **Acetic Acid** 1 part, water 2 parts, and then washes with boric acid lotion. The treatment (which is painless under coca-renin), is repeated in two or three days.

Röszler[9] has tried **Carbon Dioxide Snow** in eight cases, but has not found it to possess any advantage over expression of the granules and brushing with silver nitrate (2 per cent). Harston's[10] experience of the snow treatment in a much longer series has been more favourable.

In severe cases of trachoma, with or without pannus, Colonel Smith injects 20 min. of 1–4000 **Cyanide of Mercury** solution under the bulbar conjunctiva in the upper fornix. Gr. 2 of opium are administered to the (adult) patient twenty minutes before injection, and a few drops of 10 per cent cocaine are dropped into the conjunctival

sac, which is washed out with 1-2000 perchloride of mercury lotion before the puncture is made. The injection causes " ballooning " of the conjunctiva all around the cornea. Pain is gone in two hours. The conjunctiva and lids become œdematous, but in a week all swelling is gone, though the conjunctiva remains red. Another injection may now be given in very bad cases. Strother Smith,[11] who has used this treatment in 1500 cases, is more than pleased with the results. The pannus clears up from below, corneal ulcers heal, nebulæ become thinned, the granules disappear, and there is a remarkable improvement in the vision.

Epithelioma of Eyelid.—Five cures of this disease have been reported by Baquis[12] after the use of **Jequiritin** (the active principle of jequirity beans—*Abrus precatorius*—an infusion of which has long been used in South America for the treatment of trachomatous pannus), which was applied to the " rawed " surface of the growth. Weeks, or even months, were necessary to complete the cures, according to the number of applications required. The treatment was first proposed by Rampoldi.

Phlyctenular Conjunctivitis.—That this affection is in some way related to tuberculosis is now generally admitted. Many of the patients have enlarged glands, if not actual tuberculous disease. In fact, Tivnen[13] has used **Tuberculin** in the treatment of phlyctenules with some success. So also has Bryan,[14] who noted a distinct improvement even after two or three injections. For some reason Tivnen's cases required much longer treatment, six months or more.

Primary Syphiloma of the Bulbar Conjunctiva.—An example of this condition is related by Comninos and Marcoglou.[15] The Wassermann test was positive. Forty cgrams of **Salvarsan** were injected intravenously, and 50 cgrams three days later. In ten days the eye had cleared up.

Primary Syphiloma of the Eyelid.—A case is reported by Poli.[16] The left upper lid was affected, and the pre-auricular and submaxillary glands on the same side were enlarged. **Mercurial Injections** were given, and the lid was healed three months later. The patient was a cook in a foundling hospital, and as syphilis was denied by the husband, Poli believes that the woman was infected by a syphilitic child among the inmates.

Multiple Primary Syphiloma of the Eyelids must be reckoned as very rare. The case related by Pasetti[17] occurred in a woman who kept an inn, and the infection was probably by way of a towel. The first lesion was on the right upper lid, and before Pasetti saw her had been treated as a stye. A few days later there appeared a small lump on the left upper lid, and an abrasion on the left infra-orbital region. The Wassermann test was positive, and the diagnosis was confirmed by the appearance of a characteristic roseola. Injections of **Sublimate** brought about a rapid improvement.

Tuberculosis of Conjunctiva.—Casali,[18] in 1908, reported three cases which he had cured by means of **Röntgen Rays.** More recently, he

and Mazzoni have successfully employed **Radium** in six cases. Casali finds that radium cures more quickly than the rays, and that its application is less troublesome to doctor and patient. While **Excision,** followed by cauterization, is advised when the affected area is small, radium should be used if the disease is so extensive that removal by the knife would cause deformity.

Opin's[19] case of primary tuberculosis of the bulbar conjunctiva deserves mention. The patient, a boy fifteen years old, had had a red but almost painless eye for two months. The growth was at the limbus, and presented several clear yellowish pin-head nodules, but there was no evidence of tuberculosis elsewhere, and the temperature was normal. A few days after the boy's admission to hospital, Opin completely excised the growth, and one of the nodules was inoculated upon a guinea-pig. A month later, recurrence of the growth in the cicatrix was noted. To confirm the diagnosis of tubercle, two injections of Koch's old tuberculin were given; these were followed by a rise of temperature and a local reaction at the seat of disease. Meanwhile, inguinal adenopathy and loss of weight were noted in the guinea-pig, and when killed three months after inoculation, general tuberculosis was found. When the boy had been under observation five months, he began to get thin and to have a nocturnal rise of temperature; a small growth appeared on the left forearm, but there was still no evidence of lung disease. Then severe headache set in, and the boy died three days later. The autopsy revealed a tuberculoma at the base of the brain, and an acute miliary tuberculosis of the lungs and meninges. To Eyre,[20] **Tuberculin** has been of the greatest service. Injections, spread over periods varying from four to fourteen months, have cured ten out of eleven cases of tuberculosis of the conjunctiva. He uses Koch's T.R. (human.)

Argyrosis Conjunctivæ is more common now than before the introduction of organic preparations of silver into ophthalmic practice. Theobald[21] protests against the indiscriminate prescription of argyrol and protargol for forms of conjunctivitis which yield just as readily to a weak solution of zinc sulphate. He knows a physician who, by long-continued use of argyrol for a mild chronic inflammation, has caused a permanent discoloration of his conjunctivæ. The case reported by Gabrielides[22] is of interest, because the cornea was stained as well as the conjunctiva. The patient had for years used silver nitrate and protargol for granular lids. Alt[23] reminds us that the occasional touching of a corneal ulcer with silver nitrate is not likely to cause argyrosis, but he recalls two instances in which a long course of argyrol left a dark ring at the healed margins.

Parinaud's Conjunctivitis.—Verwey[24] reports two examples of this somewhat rare disease. The implantation of a fragment of a conjunctival nodule into the anterior chamber of a guinea-pig produced, so he believes, a typical tuberculous iritis. Adams's[25] case is noteworthy because Friedländer's *Pneumobacillus* was present in pure culture on the conjunctiva of the affected eye, and was found on the

conjunctiva of the dog supposed to be the source of infection (*vide* MEDICAL ANNUAL, 1909, pp. 217, 218).

Pterygium, when it causes diplopia (by restricting the motility of the eye) or interferes with vision (by encroaching upon the prepupillary area of the cornea), requires **Operative Treatment.** An improvement on the ordinary method of removal is practised by Terson.[26] Under cocaine and adrenalin, the base of the growth is seized, and a vertical incision made through the conjunctiva, well away from the caruncle. Then two horizontal incisions outline the field of operation above and below, the lower line being close to the growth, the upper rather above its upper margin. The " head " is now grasped and dissected cleanly from the cornea, and the growth removed. A flap is made below by freeing the conjunctiva by means of two incisions concentric with the cornea. Next, three sutures are passed, first through the edge of the flap, then engaging the sclera immediately below the cut edge of conjunctiva above, and lastly passing through that edge also. On

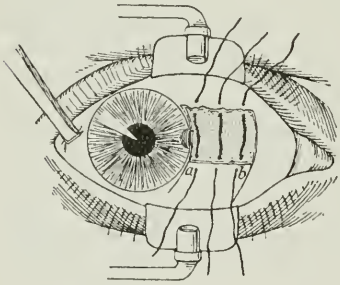


Fig. 40.

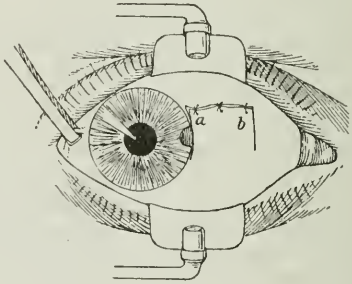


Fig. 41.

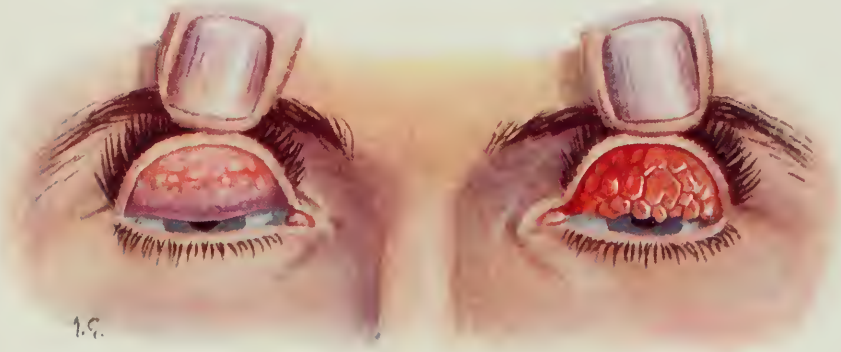
tying the sutures it will be found that the knots are (except in prominent eyes) beneath the upper lid ; the subsequent cicatrix therefore is out of sight. Terson finds that relapses are rare if the operation is performed in this way (*see Figs.* 40, 41).

Spring Catarrh is so seldom seen in this country that notices of it in current medical literature excite some interest. Mackay[27] describes a case in a boy six years old. The upper lids, and to a slight extent the lower also, were involved, but the limbi were unaffected. The right eye was treated by means of a course of exposures to **Radium,** and *Plate XIV* shows, by contrast, the marked improvement of the upper lid at the end of four months. The same treatment was then carried out on the left upper lid, with an equally good result. Two cases of the disease are reported by Gross.[28] It is pointed out by Gabrielides[29] that two or more members of a family may have it, and he is inclined to suspect a microbic source. Lea[30] brushes the tessellated surfaces lightly, once a week, with strong **Acetic Acid** 1 part, water 2 parts, and finds decided improvement, though the treatment has

PLATE XIV.

SPRING CATARRH

(Dr. George Mackay)



Right eye after radium treatment. Left eye not yet treated.

By kind permission of the Ophthalmological Society

PLATE XV.

GANGRENE OF THE EYELID

(Dr. P. Bossalino.)

Fig. A

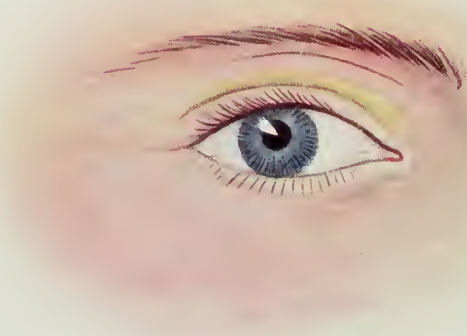


Fig. B.

Redrawn from "Annali di Ottalmologia, Pavia, 1912: Fasc. 8-10

to be continued for four or five months. The acid is washed off in a few moments with boric lotion.

Gangrene of the Eyelid.—A case of this rare condition is described by Bossalino.[31] The patient, a mechanic, received a trifling injury to the right upper lid while at work. When Bossalino saw him four days later, the lid was as illustrated (*Plate XV, Fig. A*), although antiseptic dressings had been applied. There was some fever, and mild delirium. Under treatment the œdema of the surrounding parts disappeared, the temperature became normal, and, a week after admission, the patient got up. Twelve days later, when the slough was removed, it was seen that the tissues had been destroyed down to the tarsal aponeurosis. To protect the eyeball and prevent ectropion, **Tarsorrhaphy** was performed, followed after an interval of ten weeks by the implantation of a **Skin Graft.** When, three months later, the lids were separated, almost no deformity was apparent (*Plate XV, Fig. B*). Had the slough extended to the lid margin, such a good result would have been impossible.

In some cases of gangrene of the lid, a streptococcus has been isolated ; in other (even fatal) cases no organism was found. Bossalino believes that streptococci are responsible for the " sterile " cases, but are killed off early by the antiseptic dressings.

REFERENCES.—[1]*Arch. d'Ophtalm.* 1912, Mar.; [2]*Arch. für Ophth.* 1912, June; [3]*Arch. d'Ophtalm.* 1911, May and June; [4]*Ann. di Ottal.* 1911, Fasc. 1; [5]*Centralb. für prakt. Augen.* 1911, Oct.; [6]*Ann. di Ottal.* 1911, Fasc. 4–5; [7]*Ophthalmoscope*, 1911, Mar.; [8]*Ibid.* Sept.; [9]*Wien. klin. Woch.* 1912, 87; [10]*Brit. Med. Jour.* 1911, ii, 107; [11]*Ind. Med. Gaz.* 1912, Mar.; [12]*Ann. di Ottal.* 1911, Fasc. 7; [13]*Jour. Amer. Med. Assoc.* 1911, Dec. 9; [14]*Ophthalmoscope*, 1911, Dec.; [15]*Arch. d'Ophtalm.* 1912, July; [16]*Ann. di Ottal.* 1911, Fasc. 2, 3; [17]*Ibid.* Fasc. 7; [18]*Ibid.*; [19]*Arch. d'Ophtalm.* 1912, Sept.; [20]*Lancet*, 1912, May 18; [21]*Johns Hop. Hosp. Bull.* 1911, Nov.; [22]*Arch. d'Ophtalm.* 1911, Dec.; [23]*Amer. Jour. Ophth.* 1912, Apr.; [24]*Arch. d'Ophtalm.* 1911, May; [25]*Ophthalmoscope*, 1912, Oct.; [26]*Arch. d'Ophtalm.* 1911, Mar.; [27]*Ophth. Soc. Trans.* xxxi, 217; [28]*Amer. Jour. Ophth.* 1912, June; [29]*Arch. d'Ophtalm.* 1912, Mar.; [30]*Ophthalmoscope*, 1911, Sept; [31]*Ann. di Ottal.* 1912, Fasc. 8-10.

CONSTIPATION, TREATMENT OF. *Robert Hutchison, M.D., F.R.C.P.*

Pfannmüller[1] reports on the effects of **Hormonal** in twenty-one cases of habitual constipation. He found it successful in purely atonic cases (except atony of the rectum) and in " paralytic ileus," but of no use in cases of spastic constipation and in those in which there was any mechanical hindrance to the action of the bowel (e.g., from adhesions). The effect of one injection often lasted for several months. He was able to exclude the possibility of " suggestion."

The possible drawbacks of hormonal are discussed on *page* 17.

Foott[2] advises the use of **Auto-massage** by means of a rubber ball filled with shot. An ordinary rubber ball 10 in. in circumference and 4 lb. of No. 8 shot are required. The shot will just fit into a ball of this size, which should be full and hard. To fill the ball a small slit must be made and the shot poured through a funnel—an aural speculum answers the purpose. The slit can then be closed with a

patch, applied as to a bicycle tyre puncture. A ball of this weight is suitable for an adult, about half for a child. The ball should be used regularly night and morning for ten minutes at a time, the patient rolling it over the course of the large intestine as he lies on the back. The results vary: some patients have to persevere for two or three weeks before the bowels act regularly; with others there is an immediate improvement.

See also **Agar** (*page* 3), and **Combined Glandular Extracts** (*page* 30).

REFERENCES.—*Münch. med. Woch.* 1911, 2270; [2]*Brit. Med. Jour.* 1911, ii, 1593.

CORNEA. *A. Hugh Thompson, M.D.*

Transplantation of the Cornea.—Zirm's case of successful transplantation of the human cornea in a case of leucoma was referred to in the MEDICAL ANNUAL for 1908 (*page* 197). Since then there have been only four other similar cases reported.

The difficulty of obtaining the cornea of a freshly excised human eye at the moment required is sufficiently obvious. Magitot,[1] of Paris, has attempted to overcome the difficulty by devising a method of preserving an excised eye with its cornea transparent. The eye is kept in serum taken from the blood of an animal of the same species as the one which has furnished the cornea, at a temperature of 5° to 8° C. In this way he has been able to obtain perfect preservation of enucleated eyes for twelve to fourteen days.

A successful graft was made on a boy of fourteen with an opaque cornea, the result of a lime-burn. It was taken from an eye excised on account of absolute glaucoma, and kept for a week in a hæmolysed blood-serum taken from a person in whom the Wassermann reaction was negative, at a temperature of 5° C. A cavity was made in the opaque cornea, measuring 6 mm. by 4 mm., and as deep as possible without perforating Descemet's membrane. A piece of the same size was cut from the preserved cornea, and applied without suturing to the prepared surface of the patient's cornea. At the end of the third day, when the bandage was removed, the graft was perfectly in place and completely transparent. At the end of three weeks capillary blood-vessels encircled the graft, the edges of which became clouded. After three months the edges of the graft regained their transparency, and the final result was improvement of visual acuity from $\frac{1}{1}$ before operation to $\frac{1}{1}$ after.

Conical Cornea.—There are three possible methods of dealing with these difficult cases: by **Glasses,** either high + cylinders, or high − cylinders with axis against the rule; by Stanford Morton's **Operation;** or by the **Cautery.**

These were all referred to in the MEDICAL ANNUAL for 1905 (*p.* 204). Since that time the following have been the chief advances made in this subject. The importance of **Prophylaxis** has been emphasized by Wray.[2] According to him the disease rarely begins before the age of eighteen or nineteen. It should always be suspected when a patient first

develops astigmatism at about this age. This is generally corrected by a + cylinder axis nearly horizontal (from 5° to 20° down and in) and tends to progress. In patients bad enough to come for treatment, the cone shadow can generally be made out. At this stage the patient can overcome the astigmatism by squeezing the lids, and so obtain excellent vision; hence the danger which such patients incur by consulting opticians who are unable to recognize the condition, and encourage them to use their eyes still more, when what they require is as much rest as possible. **Rest, Bandaging,** and accurate **Correction** of the acquired astigmatism in the early stage, together with attention to the general health, are the best means to adopt when the cone is still incipient.

At later stages **Operation** is often called for, but it ought to be followed up by similar prophylactic treatment to prevent relapse. With regard to operation, it is acknowledged that Morton's has given brilliant results in some cases, but in others it has been followed by disaster. Maddox[3] has adopted a modification, in which the corneal ellipse is excised, a large broad flap is cut from the lower part of the conjunctiva, brought right over the cornea, and sutured to the conjunctiva above and at the sides. A single exceedingly fine corneal suture may also be inserted. The object of the conjunctival cover is not only to protect the corneal wound during healing, but also to draw its two edges together, and thus relieve the corneal suture from tension.

Cauterization in some form, however, is the operation most surgeons choose as being on the whole the safest and most effective. Critchett's operation of cauterizing the cone in three concentric zones, increasing in depth towards the centre without piercing Descemet's membrane, is well known. Some operators prefer to cauterize at a spot a few millimetres below the apex of the cone, and repeat the operation as often as may be necessary. Worth[4] recommends a spot in the meridian of greatest curvature, rather nearer the summit than the margin of the cornea. He prefers the thermo- to the electrocautery, and applies it with its long axis at right angles to the meridian of greatest curvature, making a cavity about 4 mm. long and 2 mm. wide, extending nearly but not quite down to Descemet's membrane. He attaches especial importance to tapping of the anterior chamber (peripherally) immediately after the cauterization, and daily afterwards for three or four days, a procedure which he says promotes rapid healing.

Interstitial Keratitis.—The possibility of traumatic origin is a point of practical importance in relation to the Workmen's Compensation Act. In a paper of much interest, Terrien[5] admits that in altogether exceptional cases it can occur, but the evidence would have to be fairly conclusive on the following points to entitle a man to compensation: (1) The absolute soundness of the affected eye previous to the traumatism; (2) The existence of a true traumatism, and the first appearance of the infiltration at its site; (3) Rapid development of the keratitis during three or four days immediately following the traumatism; (4) Absence of bilaterality, which would point to the

cause being constitutional. In a case where these conditions are satisfied, even if the patient is syphilitic, we may admit that the trauma was the exciting cause of the disease; but such cases must be exceedingly rare.

Myopia and Keratitis.—J. A. Wilson[6] analyses 100 consecutive cases seen by himself, of patients with corneal opacities in one or both eyes, from the point of view of their relation to subsequent myopia. Of the 200 eyes examined, 88 per cent had very bad or bad vision (less than $\frac{6}{12}$), and 69 per cent were myopic, the average amount of myopia being a little over 3 D. That the combination of myopia with opacities was not merely fortuitous, is shown not only by the greatly increased incidence of myopia in these eyes, but also by the striking fact that of 21 cases in which opacities appeared in one eye only, 13 out of the 21 affected eyes were myopic, while only two of the 21 non-affected eyes were so.

The mechanism of the production of myopia in these cases appears to be, according to Wilson, an increase in the curvature of the cornea itself in some, and in others a yielding at the corneo-scleral junction. As is well known, the cause of corneal opacities in the great majority of cases is phlyctenular keratitis, a disease exceedingly common among the poor, and for which bad hygienic conditions are to a great extent responsible.

Zinc Iontophoresis in the Treatment of Purulent Keratitis.—A favourable account of this treatment is given by Traquair,[7] who has followed up twenty-seven cases, mostly treated in the wards of the Edinburgh Royal Infirmary. All were cases of purulent ulceration which otherwise either would have been treated with cauterization, or were so far advanced as to contraindicate it. In only one case did more than a very slight extension of the ulcer take place after the treatment was instituted, and in only six was more than one application made, the treatment being followed up by applications of **Atropine** and **Dionine** for an average period of 16·6 days before recovery. This compares favourably with a series of sixty-seven cases treated in the same institution by cauterization, and moreover the healthy corneal tissue is not destroyed by the ionic treatment as it may be by the cautery.

The method of application is as follows: After cocainizing the cornea, the ulcer is gently rubbed with a solution of 0·5 per cent zinc sulphate by means of cotton-wool on a probe. All débris having been removed, and the cornea dried, a current 1·5 ma. in strength is applied for 1·5 minutes by means of a zinc electrode 1·5 mm. in diameter. It is important to treat every portion of the advancing edge of the ulcer. Where the process is not checked it is because the causal organisms have not been got at, not because they have proved resistant. As to the pain caused by the procedure: in thirteen cases it was either absent or insignificant; in the rest it lasted from three to nine hours, rarely more, being moderate in ten, considerable in three, and really severe in only one.

For treatment of corneal ulcers with **Pneumococcic Serum,** *see page* 41.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 18; [2]*Trans. Ophth. Soc.* 1911, 220; [3]*Ophth. Rev.* 1912, 36; [4]*Trans. Ophth. Soc.* 1912, 205; [5]*Arch. d'Ophtalm.* 1911, Sept. (*Ophth. Rev.* 1912, Jan.); [6]*Glasg. Med. Jour.* 1912, i, 241; [7]*Ophth. Rev.* 1911, 1.

CORNS. Zinc Ionization is recommended (*page* 73).

COUGH.

(*Vol.* 1912, p. 551)—The distressing cough of phthisis, together with other symptoms, may be remarkably relieved by the use of antiseptic inhalations administered by means of a mask. The combination recommended contains **Creosote, Carbolic Acid,** and **Tincture of Iodine.**

CRAMP. (*See* TELEGRAPHISTS' CRAMP.)

CURVED TIBIÆ.

(*Vol.* 1912, p. 260)—The application of a splint to the concave side of the limb, combined with elastic traction bearing on the convexity of the curve, will straighten the limb in many cases.

DEAFNESS, DETECTION OF FEIGNED. *Sir John Collie, M.D.*

The ordinary stethoscope test is very unreliable. The test consists in placing the ear-pieces of a binaural stethoscope into the ears of the examinee, and in speaking to him from the chest-piece; the tube leading to the sound or hearing ear is pressed between the finger and thumb, so that no sound is transmitted to the hearing ear. Questions

Fig. 42.—The Author's instrument for the detection of feigned deafness.

are now put, and, if answered, the allegation is that they *must* have been heard by the deaf ear through the indiarubber tube leading to the deaf ear. An aurist recently writes: "The malingerer will soon be caught out." Unfortunately, it is not the malingerer who is "caught out," but the examiner, as anyone can easily prove to himself by trying the experiment. As a matter of fact, it is impossible with

an ordinary stethoscope to prevent sound being transmitted, however tightly the ear-pieces fit the ear. The examinee, in fact, hears quite easily if both indiarubber tubes are blocked, and the test, though pretty theoretically, is useless.

The Holborn Surgical Instrument Company have made for me an instrument (*Fig.* 42) which is perfectly satisfactory. Instead of the ordinary small bone end-pieces of the binaural stethoscope, there are two glass bell-shaped receivers, which are made large enough to contain the whole auricle. The free edge is fitted with an indiarubber cushion, which is capable of being inflated, thus permitting accurate adjustment and effectually preventing sound being transmitted between the instrument and the side of the head. This latter arrangement is exactly similar to that which is found in all mouth-pieces of nitrous oxide gas apparatus. The summit of each bell-shaped receiver tapers off into a short glass tube, which may be seen in the diagram supporting the ring and little fingers of both the right and left hand,

To these tubes are attached two pieces of indiarubber tubing, each 9½ feet long. Their other ends are joined to a Y-shaped metal connection, the tail of which is attached to an ordinary glass funnel by a piece of rubber some 6 inches long.

As in Blackwell's binaural stethoscope, all constrictions are avoided where the rubber joins both the glass bell-shaped receivers, the Y-shaped connection, and the glass funnel.

The three orifices of the Y-tube connection and the glass funnel have knife edges, so that there is no lessening of the calibre anywhere. The sectional area of the indiarubber tubing between the glass funnel and the Y-connection is equal to the sectional area of one of the longer tubes. There is thus no narrowing of the lumen of the tube from the ear of the patient to the mouth of the examiner when one of the long tubes is compressed as in the experiment about to be described.

The long tube leading to the right ear is of red rubber ; the left is of black. Now, if the examinee holds the glass receivers close against his ears, and the examiner, standing apart the full length of the tube, speaks into the glass funnel in a low voice, it is obvious that sound can only be transmitted to both ears *through* the instrument. Let us suppose that the patient who is being examined claims to be deaf in the right ear. The black tube is pinched, and he is asked in a low tone whether the instrument fits comfortably. If he answers the question, it is obvious that he does, in fact, hear with the right—that is, the alleged deaf ear. Should he be so wary as to avoid this trap, a constant succession of questions passed down either of the tubes, not necessarily in accurate rotation, will certainly lead to his downfall if the deafness is non-existent. If a list is previously prepared showing the sequence of the tests to be made, and when replies are received they are noted, pretty conclusive proof of the truth or otherwise of the allegation of infirmity will be obtained.

From actual experiment it is found that if the indiarubber tubing is too short, sound is, in spite of the arrangement of the apparatus,

transmitted by aerial conduction, presumably through the skull; therefore, the tubes should be of the length above described. Practically one avoids all possibility of transmission except through the tubes by speaking from another room, the door of which is left ajar just sufficient not to kink the tubes. This also enables the manipulation of the tubes so that the examinee cannot frame his answers according to the tube he sees pinched.

DELIRIUM TREMENS.

(*Vol.* 1912, p. 218)—An **Aperient** is given at the onset, and the diet is mainly fluid. An initial **Hot Bath** or **Cold Pack** is often highly beneficial. To induce sleep, which is the most urgent indication, a combination of **Chloral** with **Potassium Bromide** is often effective. **Paraldehyde, Veronal** and **Hyoscine** may also be used, but opium should be avoided. If heart failure threatens, non-alcoholic stimulants should be used, such as **Sp. Ammoniæ Aromat.** or **Digitalin.**

DEMENTIA PARALYTICA.

Purves Stewart, M.D., F.R.C.P.

TREATMENT.—It is now universally recognized that both general paralysis of the insane and tabes dorsalis are parasyphilitic diseases. Not infrequently the two diseases are combined in the same patient—so-called tabo-paralysis. The syphilitic element in these maladies might at first sight lead us to expect that they would respond to anti-syphilitic remedies. Unfortunately, however, in the experience of most neurologists, this is not so, for neither tabes nor general paralysis, once established, is amenable even to the most energetic antisyphilitic treatment, whether by mercury, potassium iodide, or salvarsan. This is still unexplained, and contrasts with the brilliant results obtained by the usual remedies in ordinary syphilitic diseases of the nervous system. It has been suggested that the various lesions of tabes dorsalis (in the spinal cord and posterior roots), and of general paralysis (in the cerebral cortex), with their accompanying systemic degenerations, small-cell infiltrations, proliferation of interstitial tissue, and so on, are due to a special parasyphilitic toxin, differing from the ordinary toxin produced by the syphilitic spirochæte, and that this is why ordinary antisyphilitic treatment, no matter how assiduous and intense, is ineffective in parasyphilis. Be the explanation what it may, we have to recognize the facts, and must turn to some other means of combating the parasyphilitic toxin.

For some time past it has been observed that general paralytics are often benefited as regards their mental symptoms by the supervention of intercurrent febrile diseases, e.g., enteric fever or erysipelas. To induce a severe illness such as enteric fever, however, is neither practicable nor judicious. Accordingly certain other substances have been employed with the object of inducing a temporary febrile reaction. For this purpose, von Wagner some years ago began to treat cases of paralytic dementia by repeated injections of Koch's **Tuberculin,** beginning with doses of $\frac{1}{2}$ to 1 mgram, and producing a temporary febrile reaction. If no fever resulted from these amounts, the dose was raised in a couple of days to 5 and 7 mgrams, and cautiously increased from day to day to 1, 2, and even 3 dgrams. The amount of

febrile reaction aimed at was a temperature of about 102° F. Cases were carefully selected, patients with severe malnutrition, or cardiac or renal disease, being excluded. Sometimes the patients were treated by tuberculin injections alone, in others these were supplemented by mercurial treatment.

A large number of cases have been thus treated, and Friedländer[1] has recorded his results. The injections were given hypodermically into the thigh or upper arm. In some cases the course of the disease was profoundly modified. Thus a typical tabo-paralytic, observed continuously for over three years before death, who had lost the pupillary light-reflex and the knee-jerks, recovered both after a course of tuberculin injections. In another case of paralytic dementia, with absence of the pupillary reflex in one eye, diminished knee-jerks, and a positive Wassermann reaction in the blood, treatment with tuberculin began with 5 mgrams, the dose being rapidly increased until the eleventh and last injection of 3 dgrams on the thirty-fifth day, at average intervals of three to four days. The temperature never rose above 103° F. A fortnight after the commencement of treatment the mental condition began to improve, and after five weeks the reaction of the pupil was definitely better. After seven weeks a mercurial course was started, and persevered with for six weeks. Seven weeks from the commencement of the tuberculin treatment, the patient's mental condition was so much improved that he was able to resume his business, and in spite of a fairly severe railway accident, he maintained this improvement. At the time of publication, a year later, he was at work, the Wassermann reaction was negative, the pupils reacted briskly, and the knee-jerks were normal and equal.

Cases like the above must nevertheless be regarded with a certain amount of caution. It is well known that remissions in the mental symptoms, sometimes of considerable duration, occasionally occur in general paralytics, so that we must be chary of accepting any individual case as cured. Nevertheless, as Friedländer points out, if pupillary reflexes and knee-jerks, previously absent, reappear after a particular course of treatment, we are probably justified in regarding these as results of the treatment.

Another, and perhaps in some respects a safer method of inducing febrile reactions in paralytic dementia, is by means of injections of **Sodium Nucleinate.** This method has been specially studied by Donath,[2] of Buda-Pesth. A 2 per cent solution of sodium nucleinate in fresh normal saline solution is made. The initial dose is 50 c.c. of this solution (i.e., 1 gram of the salt) injected intramuscularly into the buttock or lumbar region ; this is repeated once a week so long as a sufficient febrile reaction (101·4° F. at least) occurs. If the reaction is insufficient, the dose is increased to 75 c.c. (1·5 gram) or even 100, 125, or 150 c.c. Donath has gone as high as 180 c.c., but this is rarely necessary. It is important that the solution be not too concentrated ; thus, for example, a 4 per cent solution may produce a sterile abscess at the site of injection.

After each injection the temperature rises, sometimes to 104°F, and may be accompanied by rigor. As a rule it only reaches 101·4°, attaining its maximum in from four to ten hours, and returning to normal in one or two days, rarely as long as three or four days. This is accompanied by a leucocytosis of the blood (from 10,500 to 25,000 per cmm.), which subsides about the fifth day. The average number of weekly injections in Donath's cases was from seven to nine. Out of fifteen general paralytics thus treated, Donath reports that three were able to resume their ordinary work, six were improved, five were unchanged, and one died of apoplexy during the treatment.

Fischer,[3] of Prague, in the discussion on Friedländer's article, was of opinion that tuberculin and nuclein were of equal value, and recommended alternating the two remedies. Most physicians, however, will prefer to persevere with one remedy at a time, whether tuberculin or sodium nucleinate.

The writer has used the treatment in a number of private patients within the past year, and in each with remarkable benefit, both mental and physical. But until these cases have remained under observation for a further term of many months, it is premature to pronounce an opinion as to whether a cure has been achieved or merely a remission in the course of the malady. Repeated observations will be necessary, not only upon the ordinary mental and physical signs, but upon the cerebrospinal fluid, its cell contents, and its Wassermann and globulin reactions.

References.—[1]*Neurol. Centralbl.* 1912, 992; [2]*Berl. klin. Woch.* 1910, Dec. 19; [3]*Neurol. Centralbl.* 1912, 994.

DENGUE. *Leonard Rogers, M.D., F.R.C.P.*

K. Scott and G. Davidson[1] write on a recurrence of epidemic dengue at Brisbane, where it was widely prevalent six years before. It presented the typical characters of attacking all but a small percentage of the whole population, sudden rise of temperature with quick pulse, no catarrhal symptoms, rashes and marked pains continuing some time after the attack.

A. Campbell[2] discusses the dengue-like fever of Calcutta described by Rogers under the name of "seven-day fever," which occurred in an Indian Punjabi regiment between July and September, in which 173 per mille of the strength were attacked, the men having come from a province where he states that seven-day fever is not known to occur. [It has been several times described in the Punjab.—L. R.) Another regiment which arrived at the same time from Madras, where seven-day fever is prevalent, had only 22 per mille of attacks. He thinks the disease is a variety of dengue, but that three-day fever of the Punjab is the same as Mediterranean phlebotomus fever, and that all should be included under the term dengue until the causal organisms are isolated, which is not likely to be soon if it is true that they are ultra-microscopical.

References.—[1]*Austral. Med. Gaz.* 1911, May 20; [2]*Ind. Med. Gaz.* 1911, 329.

DENTAL CARIES IN INFANCY. *Frederick Langmead, M.D., M.R.C.P.*

The late Sir William Broadbent once called the dummy teat, or so-called "comforter," an "abomination of the devil." Certain it is that it is a very potent cause, probably the chief one, of septic conditions of the mouth in infants, and a common purveyor of infections to their gastro-intestinal tracts. Ulcerative conditions of the mouth, including the palate and lips, are among the local harmful effects. The influence of "comforter" sucking on the development of the teeth and jaws has been especially studied by dental surgeons, who associate with it arching of the palate, protrusion of the upper incisors, and backward inclination of the lower incisors, producing an unsatisfactory "bite."

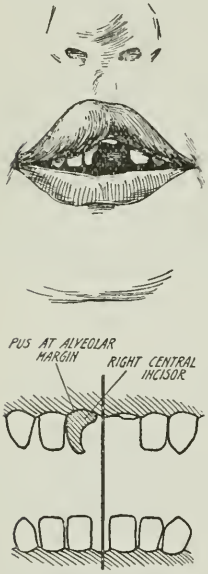


Fig. 43.—Female, 3 years. Shows some hypertrophy of upper lip; left central incisor has disappeared. Breast-fed for 17 months. No evidence of rickets or syphilis. Other teeth sound.

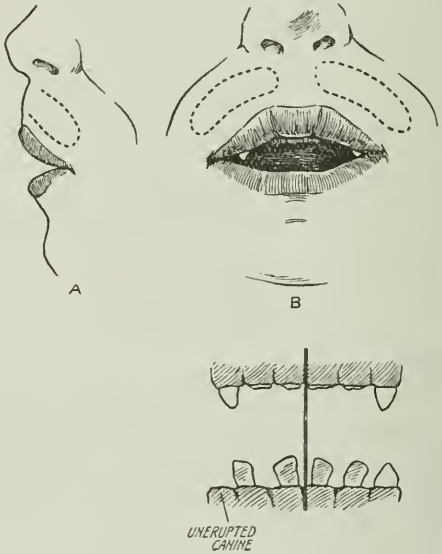


Fig. 44.—Male, 1 year 5 months, using comforter. Deformity of upper lip, hypertrophied segment of the orbicularis oris. Upper incisors are represented by carious stumps; lower incisors are badly formed, small, and irregular. A, Profile; hypertrophied segment of orbicularis oris shown by dotted lines. B, Hypertrophied segment of orbicularis oris shown by dotted lines. Appearance of child's mouth in repose.

Eric H. R. Harries[1] draws the attention of the profession to "comforter caries" (*Figs.* 43, 44). He records six cases in which he has noted extensive caries, or marked hypertrophy of the upper lip, or both, associated with persistent indulgence in the "dummy." All, with one exception, were children about three years old, and primary dentition was complete. The incisors, particularly those of the upper jaw, were the only teeth diseased.

REFERENCE.—[1]*Lancet*, 1911, ii, 1327.

DERMATITIS. *E. Graham Little, M.D., F.R.C.P.*

Bernstein[1] reports nine cases of dermatitis caused by *dinitro-chlorbenzole*, used in certain dyeing operations. The eruption begins as a violent erythema, with much œdema, vesication, intense itching, and consequent disturbance of sleep. Mucous membranes may be attacked as well as skin. Men newly arrived at the work suffered more than older hands, so that immunity is probably acquired; relapses are infrequent. All the cases responded rapidly to simple antipruritic remedies which are not further specified.

Satinwood has been shown to produce a form of dermatitis in workers in that wood, and Cash[2] contributes a very exhaustive article on the factors in the causation. East Indian satinwood seems the most deleterious, and the active principle concerned is a crystalline alkaloid called *chloroxylonine*. Experimental application of the dust from satinwood to the writer's skin produced, in four days, much irritation, redness, and induration, accompanied by intense itching and subsequent vesication. The subject remained hypersensitive to satinwood for three years after the experiment. Local sedatives were used, such as **Ung. Glyc. c. Plumbi Subacet.** renewed every four hours, and combined with **Potassium Bromide** internally. No prophylactic measures seemed of any use.

Zeisler[3] reports a *veronal dermatitis* which recurred again and again in a patient who had shown increased susceptibility to antipyrin and aspirin. Twelve to eighteen hours after taking 5 to 8 gr. of veronal he would develop itching on the glans penis and prepuce, which would show round reddish raised patches, finally becoming exudative. The patient gave up the use of veronal for eighteen months, and after that interval a single dose resulted in the appearance of the same type of eruption.

The same author records a series of cases of local dermatitis from handling *primroses*. The reaction varied from mild erythema to severe vesication. The treatment recommended is to paint the skin with 96 per cent **Alcohol**, and the subsequent application of "soothing" dressings.

References.—[1]*Lancet*, 1912, i, 1534; [2]*Brit. Med. Jour.* 1911, ii, 784; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 2024.

DERMATITIS, GANGRENOUS. *E. Graham Little, M.D., F.R.C.P.*

A remarkable epidemic of skin disease of this character is reported by Purser[1] as occurring in the Hardwick Hospital, Dublin. The first four cases all appeared in enteric patients. The lesions, necrotic areas about the size of a split pea, were grouped on the buttocks. Later, five fresh cases, also of enteric, were found to have the gangrenous lesions on the buttock. The same eruption appeared in several other patients suffering from croupous pneumonia, diphtheria, and typhus fever. No single organism could be identified in the cases, which gave cultures of *Staph. aureus et albus*, *B. coli*, *B. typhosus*, and in one case possibly *Pneumococcus*. The epidemic thus remained essentially

unexplained ; it was thought possible that a supply of tow used for cleansing the patients was the means of spread. The treatment adopted was to cauterize the gangrenous areas with **Liquid Carbolic Acid,** cleanse with methylated spirit, and dust with boric powder.

REFERENCE.—[1]*Quart. Jour. Med.* 1912, July, 422.

DERMATITIS VEGETANS IN INFANTS.

E. Graham Little, M.D., F.R.C.P.

The exact place in nosology of the cases described under this head by Wende and Groat[1] is difficult to determine. Clinically they resembled the adult disease described by Hallopeau under a similar name, which many authorities now regard as a form of pemphigus vegetans. The common factors in the cases described (which are rare, for only ten are collected by the author) are: infancy (all under one year), proneness to occur in association with eczema, the development of vegetating masses commencing with papulo-pustules, and the rapid subsidence of the condition under local antiseptic measures. In three cases staphylococci only were isolated from the lesion. Bromide-eruption, which the condition obviously resembles strongly, could be excluded. The tumours disappeared without scarring under **Local Antiseptic** treatment within two to eight weeks.

REFERENCE.—[1]*Jour. Cut. Dis.* 1911, 473.

DERMATOSES OF INTERNAL ORIGIN. *E. Graham Little, M.D., F.R.C.P.*

Rheumatic Affections of Skin.—Galloway[1] classes the eruptions associated with the numerous toxæmic states grouped under the heading of rheumatism as follows :—

1. *Sudamina.*—This is a vesicular eruption the result of sweating, and is best treated by keeping the skin scrupulously clean and dry by sponging with a lotion of **Eau de Cologne,** and then dusting a fine powder, not containing starch, over the skin ; e.g., cimolite 60 parts, zinc oxide 30 parts.

2. *Urticarial Eruptions* are uncommon in true rheumatic fever, and occur more frequently in children than in adults. In some forms of this eruption, administration of **Arsenic** is indicated.

3. *Erythemata.*—These are the most frequently met with ; they may be punctate, scarlatiniform, or exudative, the latter occurring especially in septic arthritic states. Galloway recommends the practitioner to regard erythema nodosum as definite evidence of true rheumatic fever ; and he sees " connecting links " between erythema nodosum and erythema induratum of Bazin, which is more usually regarded as definitely tuberculous.

4. *Purpura* must be looked upon as " an indication of serious disease affecting the vascular tissues and the blood." Rest is essential, as the risk of endocarditis is considerable.

In all cases of rheumatic skin eruptions the exciting cause must be treated ; this is often sepsis of the mouth or genito-urinary system, which must be carefully examined in all cases. When true rheumatic

fever is suspected, e.g., in erythema nodosum, **Salicin** and the **Salicylates** must be given for a short period in full doses. Locally, **Calamine Lotion** may be dabbed on the surface with cotton-wool. Ointments are, as a rule, to be avoided.

Toxic Dermatoses.—The question of the specificity of erythema multiforme, urticaria, dermatitis herpetiformis, pemphigus, and some other eruptions of the skin, and the greater probability that these eruptions have a common toxic factor, is the subject of a "symposium" which is reported under the above title. Hartzell,[2] Fordyce,[3] Johnston,[4] and Anthony[5] maintain a thesis which may be briefly described thus: erythema multiforme, urticaria, dermatitis herpetiformis, and pemphigus are not separate or distinct diseases; they are all caused by toxic absorption, usually from the alimentary canal, but sometimes from other sources, and in the cases when chronicity or recurrences are observed, a state of anaphylaxis may be assumed, i.e., the patient is hypersensitized to the particular poison which may be present, usually an albuminous body, but occasionally, as in the susceptibility to special drugs, a simple inorganic substance. In urticaria ex ingestis, for example, the food albumin is not sufficiently split up by the intestinal juices, and heterogeneous albumin is absorbed into the circulation. Acquired susceptibility may be transmitted by heredity. Disorders of digestion, and notably hyperacidity; disorders of nitrogen metabolism, and anaphylaxis, are convenient headings under which the phenomena observed are grouped.

In the treatment, **Salicylates,** which are toxin eliminators, **Adrenalin Thyroid** medication, "which is quite as effective in destroying urinary evidence of disordered protein metabolism as mercury the Wassermann reaction" (Johnston), **Atropine,** and **Antacid Diet** are the most successful remedies.

The phenomena of anaphylaxis in toxic skin eruptions form the subject of the second Goulstonian Lecture (1912) by Adamson,[6] who includes in the list of diseases which may possibly be ascribed to the operation of anaphylaxis, erythema, purpura, urticaria, eczema, psoriasis, lichen planus, alopecia areata, pemphigus, scleroderma, leucoderma, pityriasis rubra, the tuberculides, and a number of others.

Vascular Diseases of the Skin.—Under this heading Colcott Fox[7] contributes an elaborate essay on the classification and description of erythematous, urticarial and hæmorrhagic eruptions, the common factor being toxæmic absorption, of which the skin eruption is only one, and that usually not the most important, symptom. Amongst the commoner proximal causes may be mentioned septicæmia; absorption of toxins from local infected areas; poisoning by unwholesome food, and by drugs; the action of enemata; toxic poisoning from membranous colitis and renal disease; the absorption of serums, toxins, and vaccines. In the subsequent discussion of this paper it was noted that the prognosis of these diseases chiefly depended on the condition of the kidneys. In the intestinal cases, **Lavage** was

useful, and when an infecting organism was detected the appropriate **Vaccine** was worthy of trial.

Leukæmia and Allied Conditions.—Hazen[8] reports a new example, and contributes a very full bibliography of the reported cases. Clinically, three classes of lesions of the skin may be distinguished in the various forms of leukæmia: (1) Nodules and tumours of lymphomatous structure; (2) Œdema; (3) Lesions probably due to general toxæmia and disturbed circulation, e.g., papules, macules, vesicles, pustules, purpura, pruritus, lymphoderma, urticaria. It is interesting to note that the author includes mycosis fungoides in this group as an "aleukæmic lymphomatosis which may become leukæmic."

Treatment is unsatisfactory. When the skin lesions give no trouble they may be disregarded. When itching is present, antipruritic lotions and ointments are indicated. X-rays probably cause only a temporary disappearance. The new **Arsenical** preparations are of good promise.

References.—[1]*Pract.* 1912, i, 67; [2]*Jour. Cut. Dis.* 1912, 119; [3]*Ibid.* 128; [4]*Ibid.* 136; [5]*Ibid.* 152; [6]Bale Sons and Danielsson, London, 1912; [7]*Brit. Med. Jour.* 1911, ii, 817; [8]*Jour. Cut. Dis.* 1911, 521.

DERMATOSES, PRECANCEROUS. *E. Graham Little, M.D., F.R.C.P.*

Bowen[1] includes under the title Paget's disease (which is more usually now regarded as epitheliomatous from the outset), xeroderma pigmentosum, arsenical keratosis, chronic *x*-ray dermatitis, Unna's "sailors' carcinoma," and keratosis senilis. Two cases are recorded in detail simulating Paget's disease in histological but not in clinical appearance; in the first the eruption was on the buttock, with clinical resemblance to tertiary syphilis, but persisting for nineteen years, and showing the epithelial changes of Paget's disease. The second case showed very similar clinical and histological appearances; the lesions were on the leg, and had persisted for ten years. In both cases ultimately **Carbon Dioxide Freezing** produced the best results.

Reference.—[1]*Jour. Cut. Dis.* 1912, 235.

DIABETES. (*See also* Glycosuria.) *Francis D. Boyd, M.D.*

Treatment.—Sewell[1] discusses the existence of a specific treatment for diabetes mellitus, and reviews our knowledge of the relationship of diabetes and the ductless glands. Modern thought tends toward the conclusion that practically all the functions which we have been accustomed to define as the criteria of life in matter, are carried on by protoplasm, through the agency of quasi-adventitious radicals which may join or separate from protoplasm without altering its integrity. These enzymes may cause a rearrangement of contiguous molecules without themselves being disorganized. They are essential agents in metabolism. Muscle substance contains a glycolitic ferment capable of converting glucose or glycogen into lactic acid, CO_2, and alcohol. Zuelzer concluded from his work that there existed a physiological antagonism between the adrenal and the pancreatic hormones, and that diabetes was the result of the balance in power turning in favour

of the former. Sewell considers it probable that one vital link is the lack or insufficiency of some tissue side-chain, receptive body, or enzyme, by means of which the healthy tissue cells are alone enabled to appropriate the sugar in the blood.

Working on this hypothesis, a **Meat Juice** was prepared as follows: 1 lb. of lean meat minced, and digested for four hours in a pint of cold water acidulated with thirty drops of dilute hydrochloric acid, at the room temperature. After digestion the mixture is strained, and the liquid drunk in the course of the day, one-half to one tumblerful at a time. Cases are quoted where marked amelioration seemed to follow the treatment. Pursuing the same line of argument, which holds deficiency of a muscle enzyme responsible for certain cases of diabetes, it seems justifiable to assume that such an enzyme needs, like the complement of blood plasma, an amboceptor to direct its energies. The internal secretion of the pancreas may furnish this intermediary body, and within recent years administration of **Extracts of Pancreas** has given encouraging results in certain cases. The author quotes a case where extracts of muscle and pancreas appeared to play a co-ordinate action in abolishing glycosuria. Other cases are quoted where the results were entirely negative.

Hodgson[2] lays great stress on the control of the diabetic patient who is mentally unbalanced on the subject of eating. This is true regarding the total quantity as well as the carbohydrate content of foodstuffs. Successful treatment depends on the degree of control which the physician can exercise over the patient. In many cases the patients need to be watched with as much care as though they were morphine habitués undergoing antinarcotic treatment. Hodgson condemns most of the gluten flours on the market. He uses a **Biscuit** containing 5 per cent carbohydrate, made after the following formula:—

Unground poppy seeds	3 lb.	Eggs	12
Ground nuts	8 lb.	Flour of dried spinach	1lb.

Salt to flavour, and milk enough to make a stiff batter.

The biscuits are dried, and put up in sealed tins, and will keep any length of time. The poppy seeds are incorporated in the biscuits to favour mastication, and the oil they contain adds to their nutritive value.

Cammidge,[3] in discussing diet, lays great stress on a determination of the proportion of urinary sugar possibly derived from protein. He works with the modified formula of Lusk:—

$$\frac{\text{Total nitrogen in the urine} \times 100}{\text{Total urinary nitrogen} \times 3{\cdot}65 + \text{food dextrose}} = \text{Co-efficient of excretion.}$$

(*See* MEDICAL ANNUAL, 1912, p. 221.) This co-efficient may vary from 100 to 0, the former figure being obtained when there is total absence of tolerance for sugar, and the latter when carbohydrate intake and metabolism are balanced. It furnishes a definite numerical indicator of the severity of a diabetes in the same way as a blood-count and the hæmoglobinometer indicate the severity of an anæmia.

Strauss, in 1911, advanced the view that **Inulin** was very well borne by some diabetics, and that its administration in some cases actually lowered the acetone excretion. Since then observations on the subject have been scanty, and none bear definitely on its influence on acidosis. Strauss[4] now offers results in the investigation of 9 cases, 5 severe or moderate, and 4 mild. He claims that the results obtained are so striking as to merit wider recognition. The diabetics under observation were by strict diet rendered sugar free, or if this were impossible the sugar excretion was reduced to the lowest possible point. Then to the daily diet were added 100 grams of inulin administered in vegetables with salt and butter, or as pancakes, or as an addition to a sugar-free fruit soup. The cases are carefully and elaborately recorded, and seem to show that giving 100 grams of inulin per diem was not only well borne, but had a definite beneficial effect on acidosis. The patients did not lose weight, but rather gained. In one case, which at the time of observation was in a very advanced stage of the disease, no improvement was noted; in 6 slighter cases there was distinct tolerance for 100 grams of inulin given over a period of a week, and acidosis, when present, disappeared. There was no evidence of any want of tolerance developing from use. Digestive disturbance was not experienced. Comparative experiments were carried out with barley and oatmeal, and inulin was found to be as well, if not better, borne than either form of food. Arloing[5] discusses the mode of action of fat on the diet of the diabetic. In a large clinical experience he has found great benefit from the use of fat, but to be successful it must be employed in the form of an emulsion, and combined with bicarbonates to avoid the occurrence of acetonuria. Along with fat there should be a temporary suppression of carbohydrates in the diet. The alimentary albumin should be reduced to the indispensable minimum required for the repair of the tissues. Olive oil should not be used, but **Oil of Sesame,** which appears not only to act as a food but to have a definite therapeutic value in the treatment of the disease.

Stürmer, in 1910, advised the use of magnesium oxide in diabetes to lower the excretion of sugar without placing the patient on a restricted diet. Hirose[6] returns to the question, and finds that magnesium salts have no beneficial influence on sugar excretion, and are of no value in diabetes.

References.—[1]*Amer. Jour. of Med. Sci.* 1911, ii, 313; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1187; [3]*Lancet*, 1912, i, 788; [4]*Berl. klin. Woch.* 1912, 1213; [5]*Rev. de Méd.* 1911, ii, 11; [6]*Deut. med. Woch.* 1911, 1655.

DIABETES INSIPIDUS.

(*Vol.* 1912, p. 19)—The administration of **Pantopon** has been recommended.

DIARRHŒA, INFANTILE. *Frederick Langmead, M.D., M.R.C.P.*

Etiology.—As H. L. MacCarthy[1] points out, serious epidemic diarrhœa is almost confined to artificially-fed babies. Holt found only 3 per cent of breast-fed infants among nearly 2,000 fatal cases. This is largely accounted for by the dirty state of the milk supplied to the

average consumer, a milk which teems with micro-organisms. Further contamination occurs in the home, especially in the crowded insanitary houses of the poor. Dirty bottles and teats and the pernicious "comforter" are other prominent methods of infection. A contributing cause, as MacCarthy suggests, may be a disturbance of balance between food elements taken into the alimentary canal and food requirements, not only in regard to quantity, but more particularly in regard to the proportion of its individual constituents. Any disturbance of balance between the food elements prevents assimilation and allows bacterial action to begin. Thus Finkelstein and Meyer succeeded in causing diarrhœa in healthy children by increasing the salts and sugars, and attributed this result to the fat in presence of an excess of salts and sugar.

The *infective* origin of epidemic diarrhœa is not doubted, but no single organism can be regarded as its cause. R. L. Forsyth[2] finds that over 80 per cent have bacteria in the stools. He recognizes four kinds: (1) Resembling Shiga's bacillus of dysentery; (2) A bacillus like Morgan's; (3) Gaertner-like organisms, which cause a long chronic illness; and (4) A form of bacillus not previously described in this disease.

H. K. Waller and G. Walker[3] agree with MacCarthy as to the poor state of nutrition of most of the infants who develop the disease. The majority of the former observers' cases were babies between four and twelve months' old, whose weights were about half those of normal children. They consider *barley-water* used as a diluent, in many instances in part responsible for the infection. It had been made at infrequent intervals and according to strange recipes. The *house-fly* is now being regarded as a potent conveyer of infection.

Symptoms.—Waller and Walker studied 125 cases admitted to East London Hospital for Children, of whom fifty died and seventy-five were discharged free from symptoms and able to take ordinary diet. In nearly all, pyrexia was present. Several were in a condition suggesting an overdose of opium—difficult to rouse, with slow shallow breathing, faint irregular heart action, and contracted pupils. Acute tetany was seen in two cases, but subsided in a few days, and was followed by recovery. Hæmatemesis and melæna occurred rarely. Bronchopneumonia was a very fatal complication, and caused death in eight cases.

Of forty-six cases recorded by MacCarthy, twenty-seven recovered and nineteen died. Among the fatal cases two types were definable. The first were those who died a few days or hours after the onset of the symptoms; the second were those who recovered from the acute symptoms, but subsequently wasted in spite of all treatment. Seven ran this protracted course and died without macroscopic sign of disease; most lived four or five weeks after, and one nine weeks. The author suggests that this condition may be due to a permanent impairment of digestion produced by the attack.

Treatment.—*Preventive.*—The greatest advances in the prevention

of death from summer diarrhœa have been in the direction of the establishment of **Centres of Instruction.** Those which have done most good have not been merely milk depôts, but centres to which babies can be brought and weighed, and so kept under observation, and from which doctors, nurses, and visitors have gone to the homes and given simple instruction in the feeding and rearing of infants. Among many statistics, those of Pisek[4] are especially interesting. Studying deaths under one year of age from diarrhœal diseases alone, in the borough of Manhattan (New York City) from January to June 1911, there was an increase of 28 per cent over 1910; but after the "milk campaign" had begun in June there was a decrease of 50 per cent, in July of 60 per cent, in August of 23 per cent, and in September of 25 per cent—altogether a decrease in the death-rate of 41 per cent. A section of the city in which the influence of milk stations was established was compared with a similar section uninfluenced by them. In the former, there was a decrease of deaths by 29 per cent compared with 1910; in the latter, an increase of 9 per cent.

Feeding.—All are agreed as to the necessity of stopping milk as soon as the disease is recognized. For the first twenty-four hours, **Boiled Water** given hot is probably better than any form of food. Afterwards, as H. D. Stephens[5] mentions, cereal gruels, such as **Barley-water** or **Rice-water,** or proteid foods such as **Egg-albumen, Plasmon Broth** with or without **Gelatin,** and **Raw Beef Juice** or **Peptonoids,** may be given. According to MacCarthy, on the other hand, albumen water results in intestinal putrefaction, unless given in too small a quantity to be of any nutritive value.

Whey is commonly employed in the early stages. Waller and Walker have found it answer well, but it produces a dirty condition of the mouth, even when freshly made every three or four hours. For this reason they prefer a 5 per cent solution of **Glucose,** to which **Albulactin** may be added. H. A. Ellis[6] recommends **Barley-water** and **White of Egg** beaten up, with an equal quantity of water or soda water. The return to milk should be made very gradually. **Desiccated Milks** form a useful stepping-stone. **Peptonized,** or **Citrated Milk,** freely diluted, is preferred by some. In any case it is well to begin with a teaspoonful, gradually increasing it if there is no return of the diarrhœa.

Saline Infusions are very valuable, and have a three-fold function: to overcome collapse, to replace lost fluid, and to dilute poison. They are generally given subcutaneously. The fluid may become too cold before it reaches its destination, especially if the rate of flow is slow. To obviate this, Waller and Walker have devised a simple apparatus (*Fig.* 45), using a vacuum flask. An india-rubber cork with two holes is fitted into it, and through these two glass tubes are introduced; one, drawn out to a fine point, allows air to enter the flask; the other, which for convenience may be of the two-way kind, leads the fluid. Not more than 8 in. of narrow india-rubber tubing are attached to either limb of the two-way tube, and into the ends of each a small silver

infusion needle is inserted. A wooden board laid across the sides of the cot, with a hole bored through the centre, acts as a support for the neck of the inverted flask. With this apparatus, the amount of saline injected was usually about 7 oz., which takes two hours to run in. The fluid, plus an additional ounce to allow for waste, is put in at a temperature of 120° F.; it is then about 105° F. when it enters the subcutaneous tissue.

Leonard Rogers[7] suggests the employment of **Hypertonic Salines,** such as have been found valuable in Asiatic cholera. He bases the frequency and amount of saline to be injected on the degree of loss of fluid from the blood as indicated by its specific gravity. Normally, according to Lloyd-Jones, the specific gravity of infants' blood is 1048 to 1049. In forty severe cases of summer diarrhœa, Rogers

Fig. 45.—Waller and Walker's Apparatus for saline transfusion with vacuum flask.

found it raised to 1056, 1058, or even more. The solution contained 120 gr. of sodium chloride and 4 gr. of calcium chloride to a pint of sterile water. This has hitherto been injected subcutaneously, except in one case, when it was infused into the internal saphenous vein as it crosses the malleolus. This treatment has given encouraging results, but needs further trial.

Gastric and **Intestinal Lavage** are often useful. Waller and Walker washed out the stomachs of their patients as a routine soon after admission, using a 0·9 per cent solution of saline, at a temperature of 110° F. They claim that with few exceptions, vomiting ceases and does not recur. Leonard Rogers recommends that ½ to 1 gr. of **Calcium Permanganate** be added to each pint of fluid with which the stomach or large bowel is washed out, to destroy and remove as much as possible of the toxic products.

Drugs occupy quite a secondary place. An initial drachm or 2-dr. dose of **Castor Oil** is useful if the case is seen early. Afterwards 2–5 min.

of castor oil, regularly administered, is still one of the most valuable drugs. Some prefer **Calomel** in small doses (gr. $\frac{1}{10}$) every hour.

A. J. Wood[8] finds no drugs of any use except **Opium,** which he prescribes as liquor opii sedativus in $\frac{1}{2}$-min. doses, in a teaspoonful of water, three times daily. When a dose is due, if there have not been two motions since the last dose given, he omits it.

Stimulants are often necessary. A. J. Wood recommends 1 dr. of **Brandy** (or **Whisky**) in 5 dr. of water, sweetened with sugar, 1 dr. being given every two hours. In conditions of extreme collapse, MacCarthy employs $\frac{1}{2}$ min. of **Liq Strych.** (B.P.) every four hours, and **Strophanthus, Caffeine,** and **Camphor** for heart failure. As Waller and Walker mention, a **Mustard Bath** or **Pack** is a useful remedy for collapse.

REFERENCES.—[1]*Med. Press and Circ.* 1912, ii, 156; [2]*Austral. Med. Jour.* 1912, i, 289 (*Brit. Jour. Child. Dis.* 1912, 368); [3]*Brit. Med. Jour.* 1911, ii, 594; [4]*N. Y. Med. Jour.* 1911, ii, 1065; [5]*Austral. Med. Jour.* 1912, i, 288 (*Brit. Jour. Child. Dis.* 1912, 370); [6]*Austral. Med. Jour.* 1912, xxxi. 30 (*Brit. Jour. Child. Dis* 1912, 370); [7]*Brit. Med. Jour.* 1911, ii, 1404; [8]*Austral. Med. Jour.* 1912, i, 263, 278 (*Brit. Jour. Child. Dis.* 1912, 368).

DIPHTHERIA.

E. W. Goodall, M.D.

SYMPTOMS.—Ch. Lesieur and J. Colombet[1] divide the abnormal *sequelæ of unrecognized diphtheria* into four groups: (1) Diphtheritic cachexia, of which the chief signs are extreme weakness, wasting, anæmia (due to diminution in the number of the red cells), palpitation, and tachycardia; (2) Cardio-renal; (3) Cutaneous; and (4) Nervous. The diagnosis can usually be made by finding diphtheria bacilli in the nasal and faucial mucous membranes, aided sometimes by a history, obtained after close inquiry, of a throat affection some weeks before. **Antitoxin Serum** in most instances is of great value in treatment. Seymour Taylor[2] relates the histories of several cases of paralysis following unrecognized attacks of diphtheria.

In an account of *diphtheritic paralysis* as met with in Fever Hospitals in Glasgow and Greenock, Andrew Love[3] states that its average yearly incidence was 6 per cent, though at the Belvidere Hospital it was as high as 8 and 11·7 per cent in 1905 and 1906. But even these last rates are not very high. Of the 85 cases of paralysis only one was of the generalized form, that of a woman aged forty-five years, with paralysis of the bladder and rectum; this is rare in diphtheritic paralysis.

Love confirms the conclusions of other observers, that the earlier antitoxic serum is injected in a case of diphtheria, the less likely is paralysis to supervene.

TREATMENT.—**Rest in Bed** in the recumbent position is of first importance. This may be regarded as a prophylactic measure against paralysis, and should be enforced for from three to six or seven weeks after an attack of diphtheria, according to the severity. Vomiting should be met with rectal feeding. When the pharynx is paralyzed, the foot of the bed should be raised to prevent saliva trickling into the larynx. Thirst is allayed and wasting prevented by giving 4 to 8 oz.

of water per rectum twice in the twenty-four hours, in addition to the nutrient enemata. **Strychnine** should be administered either with the rectal feeds or hypodermically.

Cardiac failure in diphtheria is shown by rapidity of pulse, alteration of the cardiac sounds and action (extrasystole, intermission, reduplicated sounds, and marked feebleness of the sounds), vomiting, pain in the chest and down the left arm, enlargement of the liver, and suppression of urine, partial or complete. Cases presenting these signs are always serious and frequently fatal, and treatment is unfortunately very unsatisfactory. The recumbent position should be insisted upon, with the head kept lower than the trunk. As the patient is often very restless and prone to throw off the bed-clothes, he should be warmly clad and hot-water bottles should be placed in the bed. Food should be administered by enemata. In addition to these measures, E. F. Coghlan[4] recommends the following mixture, to be injected hypodermically every four hours :—

℞	Atropin sulphate gr. $\frac{1}{100}$	Adrenalin chloride solution (1–1000)	℥v
	Strychnine hydrochloride gr. $\frac{1}{100}$	Aq.	ad ℥x

In his paper on the subject, Coghlan gives details of four cases in which this treatment appears to have been efficacious.

Forbes and Newsholme[5] have recorded three cases of *nasal diphtheria* treated with **Autogenous Vaccines** of diphtheria bacilli. The doses employed were 5 million, increased gradually at intervals of five to eleven days up to 400 million. While the local membrane and discharge were lessened and finally stopped, apparently in consequence of the vaccine treatment, bacilli were still present in the mucous membrane at the end of several weeks of treatment, which was, from this point of view, not efficacious.

Calcium Salts are usually regarded as of considerable service in the treatment, prophylactic or remedial, of serum rashes. But Maurice Cassidy[6] treated 50 cases in which serum had been given, 23 with and 27 without calcium salts. Of the first group only 4 presented no rash, whereas in the second, 16 had no rash. Moreover, the duration of the rash in the cases treated with calcium was 8·4 days, as against three days in those not so treated. The chloride was the salt mostly used, though in a few cases the lactate was given, and the dose was 3 to 10 gr., average 5 gr. Nearly all the patients were children. Cassidy, therefore, does not confirm the opinion generally held of the use of calcium salts in antitoxin rashes.

Prophylaxis.—The local treatment of the fauces of persistent diphtheria carriers by spraying with a twenty-four-hour-old broth **Culture of Staphylococcus Pyogenes Aureus** is recommended by Catlin, Scott, and Day.[7] In a hospital epidemic, 31 per cent of the total population of the hospital became carriers. The most persistent of these were certain members of the nursing staff. The staphylococcus spray was used in eight of these, the diphtheria bacilli

quickly disappearing in all: the authors recommend further trial of this method. The sprays of staphylococci were used two or three times a day. No harmful results followed the injections. Incidentally this outbreak showed that the prophylactic injection of antitoxin serum was of no use. Eight out of twelve clinical cases of diphtheria which developed amongst the nurses had received from 1,000 to 2,000 units of serum from four to ten days previously.

Lake,[8] however, who tried the staphylococcal treatment in an outbreak at Fort Sam Houston, Texas, did not obtain such good results. In 5 cases the duration of the bacillus in the fauces seemed to be shortened, but it was not so in 8 others, which were very chronic when the treatment was begun. It has also been tried by Lorenz and Ravenel[9] in 17 cases. They made use of a fresh suspension of the *Staphylococcus pyogenes aureus* in normal saline solution, or a bouillon culture twelve hours old. " An effort was made to keep the spray at a temperature of about 96° F. The application itself was made first into the pharynx, the spray being directed over the uvula, each tonsil, and the posterior wall of the pharynx. Following this, the application was made into each nostril." Out of 200 applications, in only a few cases were very mild symptoms, referable to staphylococcus infection, evoked. They report favourably on the treatment, but the cases were too few to obtain any valid conclusions. The method was introduced in 1909 by Schiotz,[10] because he had noticed that in several diphtheria convalescents the bacilli rapidly disappeared during an attack of sore throat due to staphylococci.

Another method of treating these chronic diphtheria carriers is that recently introduced by Tanner Hewlett, viz., the subcutaneous injection of diphtheria endotoxin. Hewlett and Nankivell[11] record several cases treated in this manner. The results were not invariably successful, but were sufficiently promising to warrant a trial in an obstinate case. The initial dose is 2 mgrams, followed by a second of 5 mgrams a week or ten days later, if diphtheria bacilli are still present in swabs of the fauces. Further doses of 5 mgrams may be given at the same intervals.

Oskar C. Gruner, M.D.

Cave[12] studied the question of whether *B. diphtheriæ* can turn into Hoffmann's bacillus, and found that the latter replaced the former in three out of seven cases of true diphtheria. The Hoffmann organisms did not form acid and were not pathogenic, and though subcultured daily did not show any morphological change through twenty generations. On the other hand, infection by Hoffmann's bacillus conferred a certain degree of immunity to diphtheria.

References.—[1]*Rev. de Méd.* 1911, ii, 451; [2]*Med. Press and Circ.* 1912, i, 248; [3]*Glasg. Med. Jour.* 1911, ii, 247; [4]*Brit. Med. Jour.* 1912, i, 534; [5]*Lancet*, 1912, i, 292; [6]*Ibid.* 1911, ii, 1695; [7]*Jour. Amer. Med. Assoc.* 1911, ii, 1452; [8]*Med. Rec.* 1912, i, 1228; [9]*Jour. Amer. Med. Assoc.* 1912, ii, 690; [10]*Ugeskr. f. Laeger*, 1909, lxxi, No. 49; [11]*Lancet*, 1912, ii, 143; [12]*Jour. Path. and Bact.* xvi, 466.

DRESSINGS, ANCHORED. *Priestley Leech, M.D., F.R.C.S.*

Lynn Thomas[1] draws attention to a method which has been used before but neglected, viz., the anchoring of dressings. The method is well shown in the illustration (*Fig.* 46). In an operation (say) for umbilical hernia, the sutures of the anchored dressings are passed through the skin and adipose tissue right down to the fascial buried sutures, and are placed fairly close to each other in order that the dead spaces may be obliterated. He uses neither bandages nor dressings, but applies bismuth and xeroform paste to the skin incision, and vaseline around the contact area of the skin and gauze dressing. Jocelyn Swan[2] has used the same dressing for some six years. He uses a roll of gauze about three inches longer than the wound it is desired to cover; the cutaneous margins are sewn up with a continuous thread suture, and salmon-gut sutures are passed through the skin as far as the fascia to hold the gauze. In abdominal cases he uses a firm bandage as well, as patients like the feeling of support it gives.

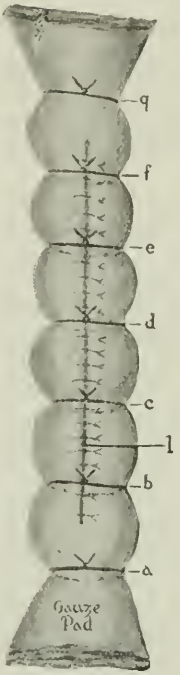


Fig. 46.
SCHEMA OF AN ANCHORED DRESSING.
The vertical line indicates the skin incision and its sutures; *a*, *b*, *c*, *d*, *e*, *f*, *g*, indicate the anchoring sutures of the gauze dressing. Note the relative positions of *a* and *g* to the ends of skin incision.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, i, 237; [2]*Ibid.* 303.

DUODENUM, ULCER OF. (*See* STOMACH.)

DYSENTERY, AMŒBIC. (*See* AMŒBIASIS.)

DYSENTERY, BACILLARY. *Leonard Rogers, M.D., F.R.C.P.*

S. T. Darling and L. B. Bates[1] have isolated the Y type of *B. dysenteriæ* from two patients in the Panama Canal zone, and in a fatal case of dysentery they recovered the organism from the circulating blood, which agglutinated in a high dilution with anti-dysenteric serum, and was culturally of the Shiga type.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 36.

DYSTROPHIA ADIPOSO-GENITALIS. (*See* PITUITARY BODY.)

EAR, DISEASES OF. *Geo. L. Richards, M.D.*

Braislin[1] has studied the anatomy of the *sigmoid sinus* and of the *jugular vein* in the new-born, and finds the principal differences from the adult to be that in the infant the sinus is straighter, and relatively as well as actually shorter; and the internal jugular vein perforates the bone more directly, with less tortuosity, and is more accessible.

Backer[2] has studied the anatomy of the *Eustachian tube* in young infants and in adults. The chief characteristic of the adult tube is

that it leaves the middle ear above the floor. The opening, while still funnel-shaped, is less so than at birth. The lumen is constricted by an isthmus. The curvature of the adult Eustachian tube, as given by fifteen casts, is that of an arc with a radius of 2 cm. There is a marked difference between curettes made on this curvature and those of Yankauer, which are curved on a radius of 2·5 cm. According to the specimens, a curette for the Eustachian tube should have sharper curvature than those of Yankauer and Yearsley, in order to hug the external wall of the tube, and so keep away from the thin bone of the internal wall which separates it from the carotid canal.

External Ear.

Morris[3] operates for *prominent ears* by taking an ellipse of skin, one-half from the mastoid region of the scalp and one-half from the posterior part of the ear, first determined by pressing the ear flat against the mastoid. Grasp the ear by the helix, drawing it well forward, and snip away the ellipse of skin with curved scissors, leaving the subcutaneous tissue as intact as possible. Remove the cartilage from the skin of the anterior aspect of the ear with small curved scissors. Make one or more openings in the concha and antihelix for proper drainage, if this has not already been done by buttonholing, in the removal of the cartilage. Suture the wound posteriorly, pack iodoform gauze upon the skin of the anterior part of the ear, and the fossa of the helix, compressing the skin gently and evenly. Posteriorly, apply two thicknesses of iodoform gauze cut to the shape of the wound between the skin of the helix and that of the scalp.

Neuralgia.—White[4] finds myalgia most frequent in the sterno-mastoid and trapezius muscles, on account of the proximity of their attachments to the structure of the external ear, and the almost direct connection with the temporal and frontal muscles. It seems due to faulty metabolism, rheumatic tendency, faulty innervation, or certain blood conditions. He treats it by hypodermic injections of sterile **Normal Saline,** repeated within three or four days if necessary. There is severe pain at the time of injection, lasting but a few minutes. Stein[5] thinks many so-called neurotic neuralgias of the ear are due (all other causes for the pain being excluded) to an arteriosclerosis of the blood-vessels supplying the ear. He suggests the name angiosclerotic otalgia. He has found good results from the use of **Diuretin** ; 0·5 gram (7½ gr.) three or four times daily for several weeks.

Middle Ear.

Otitis Media.—To prevent the progress of inflammation in its early stages, Richards[6] recommends a solution of 10 per cent **Silver Nitrate** or 10 per cent **Argyrol** applied direct to the pharynx and tube mouth on a cotton pledget, through the nose or nasopharynx. In children, when the drum is only slightly reddened, with no bulging, and there is pain without other symptoms, aural bougies are inserted in the external canal, the ear is stopped with absorbent cotton, and a

hot-water bottle placed at the side of or over the ear. Internally, **Aconitine** granules ($\frac{1}{500}$ to $\frac{1}{250}$ gr., the dose graduated to child or adult), with a minute dose of **Morphine,** from $\frac{1}{80}$ to $\frac{1}{60}$ gr., may be given, at first at fifteen-minute intervals, and then at longer periods of from one to two hours, according to the amount of pain and fever.

In the second stage, especially if the hearing distance is diminished, the **Drum is Incised** in its posterior half from Shrapnell's membrane to the floor. If nature has already caused a perforation, it is best to incise still farther, thus preventing an excessive and permanent perforation. The ear is drained with a small gauze wick, and the patient put to bed. Small doses of **Aconitine** are given internally for a few hours.

In the presence of mastoid tenderness or pain, **Ice-bags** are placed over the mastoid until the tenderness disappears, but not for a longer period than two days, since, while they relieve the pain, there is some danger that they may mask symptoms. The ear is wiped out thoroughly at least once a day. With slight or steadily diminishing mastoid tenderness and discharge, the ear is wiped and drained until the process is stopped. It may take weeks or months for the ear to become absolutely dry. Siegle's otoscope is useful in sucking out the secretion. During the acute stages, Valsalva's self-inflation may be adhered to, but the catheter is never used. Should severe complications arise they must be treated at once, and in case of doubt, it is better to open the mastoid too early than too late.

Kittredge[7] concludes that the more frequent recognition of suspected middle-ear trouble with mastoid involvement, with operative relief, would lessen the death-rate from simple meningitis. It should be impressed upon the profession that dangerously infected mastoids may be present without presenting the usual symptoms, as formerly taught ; that swelling posterior to the ear is present only late in the course of the disease ; that marked tenderness usually subsides with acute inflammatory symptoms ; that the temperature chart is not always a safe guide, a temperature nearly normal not necessarily meaning absence of danger, while a high temperature should cause suspicion of some serious complication. Even the absence of free pus in the mastoid cells does not necessarily mean that the case has been operated upon unwisely, since highly infected granulations may be present in the mastoid antrum scattered throughout the cellular structure.

Woods[8] regards the process as initially monoseptic, and the one thing necessary to bring about a cure—prevention of polysepsis. He removes the discharge from the meatus by syringing with slightly alkaline sterile water, repeated as often as discharge appears at the external meatus. After syringing, the ear should be dried. The meatus is then filled with some antiseptic, either in the form of a lotion, such as **Bor-Alcohol** (a saturated solution of boric acid and 40 per cent alcohol), or with **Boric Acid.** Peroxide of hydrogen should not be used. **Sodium Salicylate** is the best drug to use internally.

After the membrane has bulged, a linear incision should be made in it behind and below the handle of the malleus. Pain subsides, and the

temperature drops in a few hours, as a rule. If this does not happen it should not be taken for granted that the wound in the membrane is too small, but rather that the mastoid, and not the tympanic cavity, is the part of the temporal bone chiefly affected. This should be opened, and proper drainage provided. If doubt exists as to the health of the meninges, the middle and posterior fossæ should be opened, a perfectly safe procedure if no violence is done to the dura. Many children have signs of cerebral irritation, which disappear when the drum membrane ruptures or is incised.

Alexander[9] has found that in the exanthemata, **Urotropin** is very useful in the prevention of ear complications. Large doses must be given; children $7\frac{1}{2}$ gr. twice daily, adults four to six times daily. Before mastoid operations, it may be given as a prophylaxis against post-operative meningitis.

Mastoiditis.—Alderton[10] describes a symptom of value in doubtful cases,—a blurring of the outline of the mastoid tip as contrasted with that of the healthy side. The edges of the diseased tip are not as well defined as on the opposite side, owing to a mild inflammatory infiltration of the periosteum and adjacent soft structures. The symptom is elicited by grasping the tip before and behind between the fingers of one hand, while exercising control with the other hand on the opposite healthy tip.

For value of **X-Rays** in diagnosis, *see page* 57.

The choice of the Heath, Bondy, or Siebenmann operation[11] depends upon the individual case. The Heath operation is advised whenever there is fairly good hearing, and the disease is apparently limited to the antrum. Bondy's method is indicated with a hearing distance before the operation of two metres or more, provided continuity of the ossicular chain is probable, and the middle-ear cavity is itself intact or nearly so. It is especially indicated where the perforation is limited to Shrapnell's membrane, the drum membrane being intact and the hearing good, provided there is no material improvement after a conservative treatment for four weeks. Curettage of the cholesteatoma matrix is not allowable according to Siebenmann's technique.

Brown[12] concludes that the **Dry** treatment of the mastoid wound after operation yields firmer and healthier granulations, and the wound heals in quicker time with a minimum of scar results. The cavity is dusted with iodoform, filled with iodoform gauze, covered with a cushion of the same gauze, and bandaged. On the following day the dressing is removed, the excavation thoroughly washed with warm bichloride solution, and a cushion of gauze placed over the wound. The change of dressing and the bichloride injections are done twice daily until the fourth or fifth day. Care is taken in the dressing of the wound to detect symptoms of complications such as meningitis, thrombosis of the sigmoid sinus or internal jugular vein. Phillips[13] advocates the packing of the mastoid wound with strips of dry gauze, the primary dressing being done on the fifth or sixth day. At the end of two weeks light packing is used, and unhealthy granulations are stimulated by the

use of **Balsam of Peru** and iodoform gauze. Packing is discontinued as soon as the granulations have become hard and firm. The after treatment lasts from several weeks to three or four months. Persistent discharge is dealt with according to its nature and source.

Ballance[14] employs **Skin Grafting** in all his cases of mastoid operation, whether suppurative or non-suppurative. The graft may be applied at the close of the operation, but ordinarily seven or eight days after. The cavity is thoroughly cleaned with hydrogen peroxide and warm sterile saline. The graft, very thin and preferably from the thigh, is placed in such a manner as to cover the tegmen, and the inner wall of the attic, tympanum, and antrum, with epithelium. Any air or blood separating the graft from the inner wall of the tympano-antral cavity is sucked out beneath the edges of the graft by a pipette. The graft is held in place against the bone by a small sterile strip of gauze dusted with aristol. Then two grafts are so placed as to cover the raw edge of the posterior margin of the meatus, the mastoid flap is replaced and sutured with fine silkworm gut, and a dry sterile dressing is applied. The external dressing is changed daily, and the gauze tampon from the third to the sixth day. Subsequent treatment consists of irrigating twice daily with hydrogen peroxide and rectified spirits, or dry tamponing. He reports that 75 per cent of all his cases treated by this method have healed within two or three weeks, and have improved in hearing.

Intracranial Complications.—Smith[15] claims that intracranial lesions arise more frequently from acute aural disease than is generally supposed. The infection is carried by means of minute thrombi, through the mucosal or osseous veins into the sinus wall, forming a mural thrombus, which may continue to increase until the vein is entirely occluded. In chronic forms of aural inflammation, an endocranial complication usually arises primarily from osseous softening and subsequent carious erosion, the result of contiguity. When the sigmoid sinus is infected, the thrombi may extend, by way of the internal jugular, to the superior vena cava ; they may involve the cavernous sinus and ophthalmic vein by extension anteriorly through the superior or inferior petrosal sinus ; or they may travel posteriorly to the torcular and superior longitudinal sinus, the resultant septic thrombus being discovered at the autopsy. Septic thrombi may be carried to the interior of the brain by the backward motion of the blood-current when the lateral sinus is obstructed or obliterated, giving rise to metastasis. The back current or regurgitation from an obstructed sinus on one side is capable of producing a similar condition on the opposite side through the torcular.

Ruttin[16] assumes that the regurgitation from the superior and inferior petrosal toward the cavernous sinus is the cause of choked disc, and that among all otogenous intracranial complications, sinus thrombosis with operative exclusion of the sinus-jugularis region gives the highest percentage of papillitis. Of thirty cases of sinus thrombosis, eight had papillitis, in six of which it developed only after jugular ligation and the removal of the sinus ; in one case there was no examination

of the eyes, and in another papillitis had existed before ligation. The period of development varied from two days to a month after the operation.

Pike[17] resorts to mastoidectomy whenever there is the slightest reason to suggest any brainward complication following attacks of earache.

Burgess[18] reports a case diagnosed as acute otitis media, without pus formation, but with some tenderness, and no sign of meningitis. Twelve hours later, general convulsions set in, followed by coma. Operation was advised, but refused. Death resulted. The second case was diagnosed as tuberculous meningitis, with a prognosis of death within twelve hours. The following day, however, the child was up, dressed, and playing on the floor. During the night there had been profuse discharge from the ear, after which she slept well. There was no tenderness over the mastoid, no earache, nor anything to point to middle-ear suppuration. These cases illustrate the difficulty of making an accurate diagnosis in some cases of ear disease.

Meningitis.—Kopetzky[19] concludes that meningitis is a progressive disease, which may terminate in recovery in its initial stage, or may advance until it eventually exhibits frankly purulent exudation. The symptoms are dependent on increased intracranial pressure, and on the growth of bacteria and decomposition products thrown into the circulation from the disintegration of nervous tissue. The increased cranial pressure most often determines the outcome in the case. Haynes,[20] in order to lessen this, has devised an **Operation,** the purpose of which is to open the cisterna magna, without danger of cerebellar hernia, relieve the intracranial pressure, provide for free but not too rapid continuous drainage of the infected cerebrospinal fluid, afford inspection of the foramen of Magendie, and if it be closed to reopen it, and forestall possible complications such as hydrocephalus.

The patient is placed upon the operating-table, head down, and the anæsthesia is administered through nasal tubes beneath the sterile sheet which covers him. The incision is in the middle line from the occipital protuberance to the spinous process of the axis, and is carried down to the occipital bone and posterior arch of the atlas. Hæmorrhage, slight and easily arrested, is checked by mosquito clamps, and the vessels are ligated. The periosteum is now stripped from the occipital bone, taking with it the inner portions of the origin of the attached muscles, and the occipital bone is bared for a distance of about one and one-half to two inches vertically and one inch transversely at the foramen magnum, less above. The posterior arch of the atlas does not require baring. An emissary vein may be encountered in the midline; it is not constant. If present, it may be plugged by a wooden toothpick, or by boring into it with an artery clamp. The self-retaining retractor is now introduced. Two sizes of detachable blades are provided, one for adults, the other for children. The de Vilbiss trephine ($\frac{3}{8}$ in.) is applied in the midline and about one inch from the margin of the foramen magnum, and the button of bone is removed.

With the special dural separators, the dura is loosened from the bone, and the de Vilbiss bone-cutter is used to make two lines of incisions or grooves through the bone into the foramen magnum. The dural separator must be constantly used to detach the dura from the bone in advance of the bone-cutter. For this reason these separators are made in two sizes, and with a narrow shank to pass easily through the groove in the bone. The wedge of bone, cut loose, is about an inch wide at the foramen magnum and a little less at the upper border. The detachment of the bone-button is carefully completed, and it is removed. The dura presents, probably under pressure, bulging into the bone gap. The occipital sinus (or sinuses) will be seen, if present, showing a blue colour through the dura. If the sinus is double, the dura should be incised between them. If single, it should be tied at the upper part and just beyond its bifurcation into the marginal sinuses. The special, full-curved, right-angled dural needles, right and left, are provided for this purpose. (In dividing the dura, first make a very tiny incision into it, using the fine curved bistoury. This is necessary, for should the arachnoid be so closely applied to the dura as to be divided with it, there may be too sudden an escape of the cerebrospinal fluid. If the dura alone has been severed, the incision in it should be carried up and down to the limits of the opening in the bone.)

The arachnoid will now bulge into the field, unless it has been divided with the dura. The amount of its bulging will give some idea of the degree of intracranial pressure. The arachnoid is slightly nicked in the middle line, and the cerebrospinal fluid is allowed to escape, a specimen being taken for laboratory examination. While it escapes slowly, a careful watch is maintained upon the blood-pressure, pulse, and respiration, by one especially detailed for the purpose. Syncope may be prevented or lessened by arresting for a moment the flow of the fluid by gentle pressure of the finger. As soon as the excess of fluid has escaped, open the arachnoid for the full extent of the dural opening. The condition in the cerebello-medullary angle should be very carefully investigated. If there be an exudate about the parts, the lobes of the cerebellum should be raised and separated by the " pushers " provided for this purpose, and the patency of the foramen of Magendie assured. It may be necessary to enlarge the opening in the occipital bone. This is easily done by the ordinary rongeurs, or by the bone punch devised by the writer. A small wick of rubber or guttapercha tissue is placed within the margin of the dura, and left protruding from the wound. The muscles are replaced, and held together by two or three plain gut sutures (interrupted). The skin is closed above and below the drain with silkworm-gut interrupted sutures. Voluminous dressings are applied, sufficiently thick to fill out the normal hollow between the head and neck. The patient is handled with care, for the brain stem no longer has its protecting cushion of fluid. The entire operation takes from fifteen to thirty minutes. For further details, the original article should be studied.

Chronic Middle-Ear Deafness.—Wylie[21] says that relief from tinnitus,

and often from deafness, is obtained by the direct application of **Hot Medicated Air** to the tympanic cavity and membrane. He recommends inflation with the catheter twice a week for several months. In cases of perforation, the air is applied directly to the membrane through the meatus.

Yearsley[22] is not very sanguine as to the results which have been, and are likely to be, attained in the treatment of this condition. An accurate diagnosis from the symptoms, physical examination, and functional test is very essential, both as regards the choice of treatment and in estimating the results likely to be obtained. The relative acuity of the whispered and spoken speech is a rough guide to the prognosis, being fair when the spoken speech is better than that of the whisper, and bad when it is worse. He thinks **Inflation** and the use of **Bougies,** of value, and that it would be better to **Catheterize** for a time frequently than at longer periods, but over-inflation and stretching of the membrane must be guarded against. He is opposed to auto-inflation by the method of Valsalva. The conditions of the Eustachian tube and of Rosenmüller's fossa are to be studied, and treated in accordance with their conditions. The correction of nasal abnormalities is to be recommended only when it is evident that such correction will improve the aural condition. **Otomassage** is of value if used with discretion. He has not had any results with hot air or fibrolysin. The intratympanic injection of **Red Iodide of Mercury,** 16 gr. with 7 dr. of **Lanolin,** made up to 4 oz. with **Parolein**—has given good results in conjunction with otomassage, even after simple inflation had failed.

Electricity has given little or no help, nor have the various operative procedures (mobilization of the malleus, incision of the posterior fold, tenotomy of the tensor tympani or stapedius, exploratory tympanotomy, division of adhesions, removal of portions of the membrane and of the major ossicles). Only in occasional cases, where there are distinct and visible adhesions, is **Ossiculectomy** advised. Patients with non-operative diseases of this kind should be taught **Lip Reading,** and the aural profession should study much more than it has done the mechanical types of aids to hearing.

Frye[23] thinks that treatment of chronic catarrhal adhesive processes should be limited to cases with hyperproduction of the connective tissue in the middle ear, a long duration, and perhaps a progressive course. They should be accompanied by visible changes in the membrane in the shape of retraction or thickening, and have the characteristics of trouble with the sound-conducting apparatus, especially the lengthening of the bone conduction, when functional tests are applied. These changes often become noticeable after the process has gone on for several years, having had its inception in acute inflammations. Pathological conditions of the septum, middle turbinates, and accessory sinuses must be treated. There are two complaints in these cases: deafness, and subjective noises. For the latter there is no specific treatment; only that which helps to influence the changes in the middle ear will reduce the noises. The deafness is due to mechanical obstacles

in the sound-conducting apparatus. We therefore use all measures which tend to facilitate the mobilization of the middle-ear apparatus. This treatment has to extend over weeks and months. **Bougies** for the dilatation of the Eustachian tube often give satisfactory results, as well as **Vibratory Massage** of the tube with bougies. The external application of **Hot Air** is of some value. Dintenfass introduces a small lamp directly into the meatus, and subjective noises have been reduced, and in some cases cured, after such an application. Internally, **Iodine** is of the most value, and should be continued at least six weeks in medium doses.

Nitchie[24] urges the more general study of **Lip Reading** by those becoming deaf, and says three lessons a week for three months will give most pupils satisfactory and practical skill. Constantin[25] directs as to the technique of auditory examinations in children. The child should sit on the lap of the examiner, and the tests be made behind his back. The rotation of the head or the deviation of the eyes to the more stimulated side will usually indicate whether or not the child can hear. The stop-watch and tuning-forks are used for the test. Love[26] says there are now more than 5,000 children in the special schools for the deaf in England. Of these, one-fifth were due to meningitis. He urges the study of all cases of acquired deafness in order to find out how much true hereditary deafness there is. The hereditary deaf ought to be taught in regard to the danger of marriage and intermarriage. He urges the appointment of ear surgeons to all fever hospitals, since acute exanthemata are prolific causes of acquired deafness, and frequently lead to fatal complications.

Deafmutism.—Yearsley,[27] after a study of 1,076 children congenitally deaf, reports heredity and consanguinity to be the most prominent factors. Alcohol, insanity, and syphilis are the most important minor causes. He advises the prohibition of the marriage of the deaf, of blood relations, and of alcoholics, syphilitics, and those having a family taint of insanity, epilepsy, or other neuroses. Of 592 cases of acquired deafmutism, 72·2 per cent were due to suppurative or catarrhal middle-ear disease. Infectious fevers and adenoids are prolific causes of deafness. Attention is called to the importance of caring for suppurative ears in young children.

Makuen[28] discusses the education of the deaf child, and advises that it begin in early infancy. All the special senses should be developed as much as possible, even small quantities of latent hearing being especially useful in the production and modulation of the voice. The sense of touch should be trained. The training of the visual sense for lip or speech reading is of great importance. It is desirable to encourage the prattling and babbling of deaf infants, and the talking to them as if they could hear. Early neglect and undue sympathy are the greatest obstacles to success, which depends upon the teacher's ability to arouse interest in the patient. Crouter,[29] of the Pennsylvania School for the Deaf, has entirely discontinued manual classes. Hereafter all pupils will be educated by speech methods only. The manual methods have

been dropped because found to be unnecessary, and to interfere with the best progress of the pupil. Love[30] says that the special education of the deaf child should begin as soon as the deafness is discovered.

Otosclerosis.—Bryant[31] considers this lesion due to trophic disturbance, and says it may be prevented in the adult by the proper care of the catarrhal infections of childhood. Amadon[32] finds 20 per cent of these cases to be due to heredity (Denker 40½ per cent, Lucae 37 per cent, Siebenmann 35 per cent). There is a tendency to drop the inheritance after the second or third generation, but it never skips a generation from its appearance until its disappearance. It is very often associated with anæmias, arteriosclerosis, or some of the arthritides. The otosclerotic processes seat themselves in the bone of the labyrinthine capsule, on account of its peculiar anatomical and histological characteristics.

Gray[33] considers the symptoms of otosclerosis to be deafness of insidious onset, relatively prolonged bone-conduction, a loss of hearing for the lower notes, and a normal position of the tympanic membrane; often accompanied by paracusis and tinnitus, and sometimes by a rosy tint in the region of the promontory.

Beck[34] treated sixteen cases of otosclerosis by hypodermic injections of **Adrenalin,** beginning with one drop of solution, and increasing one drop a day until on the tenth day ten drops are used. The maximum blood-pressure is reached on the fifteenth day. Injections are then stopped, and resumed a few days later, beginning with one minim, and increasing as high as fifteen minims. In four cases treated by this method, in which no conversational tone was heard, the vestibular irritation was reduced, and in another patient the noises ceased. Three, who had fair hearing in one ear, improved. Four cases were treated first with adrenalin alone, and then with combined ductless-gland extracts.

Inner Ear.

Vertigo.—Kerrison[35] defines two distinct types of labyrinthine vertigo and associated ataxia—one, the familiar spontaneous type, due to vestibular irritation, and occurring only during the acute stage of suppurative labyrinthitis; and the other not spontaneous, not constant, not necessarily accompanied by nystagmus, characteristic only of the latent stage of the disease, and induced solely by sudden and unexpected calls upon the lost or defective orientation sense, in the maintenance of which the intact vestibular organs are so important a factor. He infers from his experiments that, in cases of impaired orientation, especially where the sight is lost or where one vestibular apparatus has been destroyed, the muscular, arthroidal, and tactile impressions of space and position become more sensitive and accurate, and until these senses are so developed as to make up for the lost factor of orientation, the patient suffers from attacks of vertigo or vestibular paralysis.

Putnam[36] says that the cases responding best to treatment by

Lumbar Puncture are those where the various tests show the labyrinthine apparatus in a fairly normal condition. Where the neural degeneration is far advanced, the effects of withdrawal of cerebrospinal fluid are less marked at the outset; and repetitions of the operation, which in the better cases work well, produce less and less result, and are finally of no benefit. The most favourable cases are those of pure labyrinthine origin and relatively short duration. In such no great disturbance of hearing is present, and there is no middle-ear disease. In these cases the sensitiveness of the labyrinthine apparatus to the galvanic current, which before the treatment by lumbar puncture may have been poor (as shown by the fact that it required a strong current, even 20 milliampères or more, to cause the vertigo, nystagmus, and inclination, even if they could be induced at all), may again become normal after the puncture. About 15 to 20 c.c. of fluid are withdrawn, and relief from vertigo sometimes occurs at once, sometimes after several days. In a fair proportion of cases any tinnitus which accompanied the vertigo, and often the deafness also, are relieved. Severe headache of one or two days' duration is the only bad result. Blake[37] has also found lumbar puncture give temporary relief in cases of insufficient intralabyrinthine pressure, and sometimes entire relief from the vertiginous attacks during a period of a few months to three years. He withdraws 10 to 15 c.c., and keeps the patient under observation for a few days. Often lumbar puncture is done in preference to immediate incudectomy, stapedectomy, or an operation upon the vestibule.

Yearsley[38] reports an interesting case in which the vertigo was cured after **Destruction of the Labyrinth.** The ampulla of the external semicircular canal having been opened with a fine chisel, that passage was followed into the vestibule, which was thoroughly curetted, and swabbed out with a solution of formalin. The tympanic ostium of the Eustachian tube was curetted, the wound packed, and the auricle readjusted. The ear healed without complication within six weeks. During convalescence some dizziness and nystagmus were present, but these gradually lessened and stopped. Two years later the patient reports herself in excellent health, except for inability to walk straight alone after walking for more than ten minutes. She has no sense of security or locality in darkness. Jones[39] advocates operation for the relief of aural vertigo due to causes other than suppuration. He destroys the branches of the vestibular nerve as near as possible to their entrance into the vestibule.

Politzer,[40] reporting on eighteen fatal cases of chronic purulent otitis, found pathological changes in the labyrinth in ten, while in eight it was normal. All showed evidence of meningitis on admission to the hospital.

General Treatment.

Vaccines.—West[41] finds that cases of *furunculosis of the meatus* generally clear up after an injection of 40 million killed *Staph. aureus*, followed in from three days to a week by a similar dose, and at

the end of the third week by 100 million. For recurrent furuncles, an isolated injection of 40 million is required once in six months. In treating cases of *lateral sinus thrombosis*, the patient, before leaving the operating-table, receives a serum of 40 c.c. of *Str. pyogenes*, followed by a similar dose twelve hours later. In addition, a vaccine from a stock *Str. pyogenes*, in doses of 5 million, is given. An autogenous vaccine is later substituted for this stock vaccine, the dose increasing to 100 million if necessary. Seventy-five per cent of these cases recover. Meninges and brain infections are helped by the sera and vaccine, only when the case is diagnosed early enough, and the primary infections are removed. In chronic suppurative otitis media, the most marked results have been obtained from vaccine in *B. pyocyaneus* infections.

In *non-suppurative conditions, originating in the nasopharynx*, vaccine has greatly lessened post-nasal catarrh, but deafness remains the same. Cultures taken from the nasopharynx show in a series of fifty consecutive cases, 70 per cent pneumococcal. In a second group of cases, *Staph. aureus* was dominant in 26 per cent; staphylococci were present in over 40 per cent of the cases. The streptococci bulk less largely, and as the series included only strictly chronic cases, *M. catarrhalis* was rarely present (8 per cent). Other Gram-negative cocci were present in large number in 14 per cent of cases. The only other group of importance is furnished by infections by *B. Friedländer*. In pneumococcal cases, autogenous and stock pneumococcal vaccines carried up to large doses have given no results. In cases of mixed infection, the pneumococcal element survives, but the Friedländer organism disappears. The staphylococcal cases show improvement in catarrh, and the *M. catarrhalis* and *B. Friedländer* cases do well. In streptococcal cases, the initial dose of *Str. pyogenes* is about 5 million. The repetition and increase of the dose depend on the individual and on the results obtained. In these cases no attempt was made at control by the opsonic index, nor are more elaborate methods considered necessary.

After three years' experience with vaccines, Christie[42] finds them especially useful in cases resistant to local treatment. When it becomes evident, after ten days to three weeks of local treatment, that the case will be of long duration, the use of vaccines is begun, the local treatment being continued, since they are not used to the exclusion of other methods. Out of twenty-five cases of severe type, treated with vaccines, in twenty the results were entirely successful. All cases of acute otitis media which do not end fatally are curable theoretically at least, but the large number of patients with chronic otitis media proves that many are not cured, but become chronic, and those not curable by local measures or the vaccines should have the simple mastoid operation performed. In subacute cases, vaccines are of value, but in chronic ones their field of usefulness is much more restricted. (*See also page* 49.)

Salvarsan.—Biggs[43] finds it of use in syphilitic deafness only when

combined with inunctions of **Mercury** and large doses of **Potassium Iodide.** Beck and Voorhees say that if the inner ear is in normal condition there is no contraindication to salvarsan. In old syphilis of the ear its use should be guarded, especially if there be degeneration of the cochlea or vestibular nerve. In congenital deafness it may be of value if injected while the child is still young, provided the hearing for ordinary speech is at least four feet, and the vestibular apparatus functionates normally. If syphilis of the ear is suspected, the advice of an otologist should be had before the injection of salvarsan.

REFERENCES.—[1]*Laryngoscope*, 1911, Dec.; [2]*Ibid.* 1912, Jan.; [3]*Med. Rec.* 1912, Mar.; [4]*Ann. Otol.* 1912, June; [5]*Wien. klin. Woch.* 1912, June; [6]*N. Y. Med. Jour.* 1911, Oct.; [7]*Bost. Med. and Surg. Jour.* 1912, Sept.; [8]*Brit. Med. Jour.* 1912, Aug.; [9]*Ibid.*; [10]*Laryngoscope*, 1911, Dec.; [11]*Ann. Otol.* 1912, Sept.; [12]*Ibid.* 1911, Dec.; [13]*Laryngoscope*, 1912, Mar.; [14]*Lancet*, 1912, Aug.; [15]*Ann. Otol.* 1911, Sept.; [16]*Laryngoscope*, 1912, Nov.; [17]*M.R.C.S.* 1912, Jan.; [18]*Pract.* 1911, Dec.; [19]*Laryngoscope*, 1912, June; [20]*Ibid.*; [21]*Clin. Jour.* 1911, Dec.; [22]*Jour. Laryng.* 1911, Dec.; [23]*Ibid.*; [24]*Ann. Otol.* 1911, Mar.; [25]*Laryngology*, 1912, July; [26]*Ibid*; [27]*Lancet*, 1912, July; [28]*Laryngoscope*, 1911, Nov.; [29]*Volta Rev.* 1911, Jan.; [30]*Ibid.*; [31]*Ann. Otol.* 1911, Sept.; [32]*Laryngoscope*, 1912, July; [33]*Ibid.* Jan.; [34]*Ann. Otol.* 1912; [35]*Laryngoscope*, 1911, Oct.; [36]*Bost. Med. and Surg. Jour.* 1911, Sept.; [37]*Ibid.*; [38]*Lancet*, 1912, Feb.; [39]*Liverp. Med.-Chir. Jour.* 1912, July; [40]*Arch. Otol.* 1911, May; [41]*Clin. Jour.* 1911, Oct.; [42]*Med. Rec.* 1912, Sept.; [43]*Brit. Med. Jour.* 1912, Aug.

ECTOPIC PREGNANCY. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Ladinski[1] lays emphasis on the necessity for immediate operation in cases of extra-uterine gestation, whether ruptured or unruptured. In a series of 200 cases there were three deaths; in one, the rupture occurred in the out-patient department, and the patient died in two hours, and the others were the only two cases in which he decided to postpone operation pending improvement in the patient's condition. He does not regard shock following rupture as a contraindication of operation.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 854.

ECTROPION. *A. Hugh Thompson, M.D.*

Davis[1] describes a new method of operating, applicable alike to slight cases of atonic ectropion and severe cases of the cicatricial variety. The principle consists in shortening the tarsus at the temporal extremity, and then attaching this extremity to the periosteum of the temporal border of the orbit, on a level slightly above the lid commissure.

The operation is performed as follows: (1) A canthotomy is performed extending to and slightly beyond the orbital margin, exposing the periosteum; (2) The edge of the lid, including the cilia, is pared off to a slightly greater extent than the piece of tarsus to be removed; (3) The skin and orbicular muscle are separated from the external canthal ligament and the outer end of the tarsus; (4) A triangular piece of the tarsus, more or less extensive according to the extent of the ectropion and lengthening of the lid border, is excised. In case of redundancy of the skin, a triangular piece of skin equal to that of

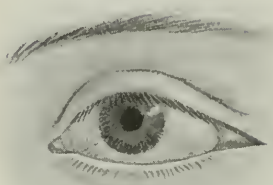


Fig. 47.—This and the following five figures show Davis's operation for ectropion. Canthotomy, the first step.

Fig. 48.—Tarsorrhaphy.

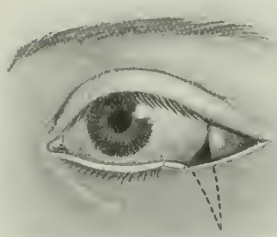


Fig. 49.—Triangular piece of tarsus removed.

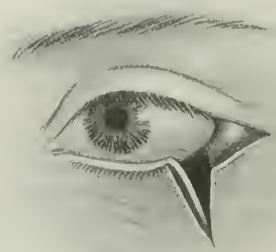


Fig. 50.—Triangular piece of skin removed.

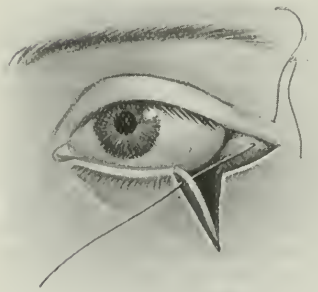


Fig. 51.—Insertion of anchoring suture.

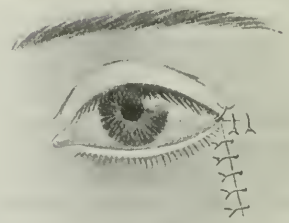


Fig. 52.—Completed operation.

the removed tarsus, is removed; (5) A No. 6 silk suture is placed through the outer extremity of the shortened tarsus near the margin, the needle being passed from without inward; then the needle is carried through the periosteum of the rim of the orbit (slightly above the commissure if the lower lid is being operated on, and slightly below if the upper lid is being corrected); the needle is brought out, and continued through the skin from the under surface outward. The suture is tied in a single knot. If enough tarsus has not been removed to correct the deformity, the suture is loosened, a little more of the tarsus excised, and the anchoring suture reapplied as before. The skin wound is closed with fine silk sutures. A dry gauze dressing is put on and a bandage applied. The skin sutures should be removed on the third or fourth day, while the anchoring suture, which can be reached on the skin surface where it is brought out on purpose, should not be removed until the seventh day.

In slight cases, the anchoring suture is sufficient without the removal of skin. On the other hand, in cases of unusual severity, it is advisable to remove a triangular piece of skin from beyond the external canthus, the undermined skin from the lid being slid over the cartilage and sewn in that position. The procedure is explained by *Figs.* 47 to 52.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* Nov. 1911, 1682.

ECZEMA. *E. Graham Little, M.D., F.R.C.P.*

Brocq[1] has an illuminating lecture on eczema, which he classifies as (1) True vesicular eczema; (2) Papulo-vesicular eczema, approaching urticaria or prurigo; and (3) Seborrhœic eczema. In the first class diet, mode of life, the nervous system, and various organs must be investigated; and local applications of **Tar** are recommended. In the second class in the acute stage, where there is much scabbing and œdema (and active congestion), inert **Powders, Cold Cream, Lard,** or mere **Boiled Water Compresses** should be used. When less acute, **Coal Tar** either alone or mixed with casein varnish is an excellent application. For seborrhœic eczema **Zinc Paste** with **Thiogenol, Thiol,** or **Sapolan** is especially useful.

Stopford Taylor[2] finds salvation in the following method of treatment: *wet* lint is spread with the ointment desired (Lassar's paste is his favourite), and then butter-muslin, also wet, is interposed between the ointment and the skin, and the dressing kept in situ with muslin bandages. For infiltrated areas the dressing is covered with impermeable material. In acute cases the dressing is to be changed twice a day; in chronic cases twice weekly. For infants, the facial mask is retained in position constantly, the dressing being changed twice a week, and with a second mask ready to take its place so that exposure may be momentary.

In chronic "verrucose" eczema nothing succeeds like freezing with **Carbon Dioxide Snow.** Massage is also often very useful.

REFERENCES.—[1]*Med. Press,* 1912, i, 7; [2]*Brit. Med. Jour.* 1911, ii. 823.

EMPHYSEMA. (*See* LUNGS, SURGERY OF.)

EMPYEMA. (*See* PLEURISY, SURGICAL TREATMENT OF.)

ENURESIS NOCTURNA. *Frederick Langmead, M.D., M.R.C.P.*

ETIOLOGY.—Ruhräh[1] agrees with most modern writers on this subject, regarding enuresis as a symptom, the underlying cause of which should be sought diligently and treated where possible. Some of the children who suffer from this complaint have imperfect or *undeveloped spinal cords*. The diagnosis in these cases can only be suspected, but should be considered if the condition proves intractable to treatment. Frankl-Hochwart has noted the fact that many adults suffering from neurasthenia give the history of enuresis in childhood. Certain cases are allied to *epilepsy* in Ruhräh's opinion, and he quotes Pfister,[2] who believes that those cases where the enuresis first occurs after five years of age and in which the symptom is not constant but intermittent, belong to this class.

With regard to *reflex* enuresis, he thinks that many of the patients possess an over-irritable nervous system, which may account for the very small exciting lesion, but in others the lesion is marked and would affect the nervous system of a normal child.

Among the common reflex causes are vulvitis and vaginitis in girls, and urethritis and balanitis in boys. The seat of irritation may be in the rectum, e.g., polypus, fissure, or ulcer, or perhaps more frequently thread worms. Calculi, tuberculosis of the bladder, and vesical polypi are also mentioned. Bed-wetting may be due to the drinking of too much fluid late at night, or may result from mere laziness; in other instances, the child may sleep so soundly that the warning of the distended bladder is unheeded.

Merklen[3] considers enuresis an element of *weak motor inhibition*. Freund,[4] on the other hand, stated that in about half of the cases of enuresis there exists a hypertonia of the muscles of the legs, and he therefore attributed the involuntary micturition to an exaggeration of the vesical tone. In opposition to this view, Merklen gives some interesting statistics. Of 164 children between the ages of three and fifteen years, in 116 the muscles were normal, and in 48 weak. The 116 normal children included only 8 who suffered from enuresis, whilst the 48 with weak muscles included 18. He states that in these children cataleptoid attitudes are more common than in normal children.

The well-known connection between enuresis and *adenoids* is supported by the following figures quoted by Ruhräh. Fisher operated on 716 cases, and of these 106, or 14·8 per cent, had enuresis. Mygin, in 400 cases, found 31, or 7·75 per cent. Gruback, in 427 cases, found 61, or 14·28 per cent. On the other hand, Lilang examined 50 children with enuresis, and found only eight who had adenoids. He operated upon these, and cured only one. In this context it must be borne in mind that rheumatic children are very subject to both abnormalities, and in them the enuresis might be ascribed to the adenoids instead of

to the rheumatism. Leonard Williams[5] has described a group of cases having special characters. The children suffer from a subnormal temperature; they complain of the cold although somewhat overclothed, and they often have what is known as "dead fingers." They feel cold even in summer, and more by night than by day. They are undersized and under weight. About half the cases have adenoids, but without any difficulty in nasal respiration. A high-arched palate was present in all these cases. Williams believes that these signs indicate *thyroid insufficiency*.

The effect of a *long adherent prepuce* has been studied by Hamonic, who believes it an important factor in causing enuresis. He has performed 187 circumcisions in order to cure the enuresis, and of these 130 were cured; fifty-seven were lost sight of.

Ruhräh gives the following summary of the etiology:—

Physiological: Taking too much fluid.

Eliminative: Due to faulty metabolism; eating too much salt, etc.; drugs.

Urine: Hyperacidity; alkalinity; bacteriuria.

Genito-urinary organs: Urethritis; cystitis; pyelitis; malformations; calculi; tumours or polypi; hypertrophy.

Nervous system: Hypertonia or irritability of bladder; weakness of sphincter; balanitis; vulvovaginitis; anal fissure; rectal polypi; intestinal parasites; malformation of spinal cord; general irritability.

General: Diabetes mellitus; diabetes insipidus; rachitis; thyroid insufficiency; enlarged adenoids and tonsils.

Treatment.—Ruhräh summarises the method as follows:—

Restriction of fluids; diet; protection from cold; rest and quiet life; postural treatment; waking child to empty bladder; suggestion not to urinate; suggestion to call out in sleep that there is a desire to urinate; moral hygiene in lazy children.

Reflex irritation: Passing catheter or sound; galvanic current; galvanic cautery; faradic current; injections of nitrate of silver solution; injections of normal salt solutions, etc.; epidural injections (Cathelin); retrorectal (Jaboulay); perineal (Cahier).

Drugs: Atropine sulphate; strychnine sulphate; bromides; ergot; hexamethylenamin; desiccated thyroids.

Among the newer forms of treatment is that of **Desiccated Thyroid,** which is used by Leonard Williams in the class of cases described above. In a series of twenty-five cases, all are stated to have progressed very satisfactorily, with one exception. He gives gr. $\frac{1}{2}$ of dried thyroid twice daily to children of between two and six years old, and somewhat more to older children. Ruhräh has employed the same treatment in a series of unpicked cases, and found that in those in whom signs were found which might be attributed to thyroid insufficiency, the results were "quite remarkable." They were all children with enlarged tonsils and adenoids. The good effect was obtained promptly or not at all. The undersized children gained weight rapidly, as Williams had observed. In other instances in which

the children had high-arched palates but no subnormal temperature, the thyroid had no effect.

A. C. D. Firth[6] has also investigated this method. Twenty-eight unselected and consecutive cases were so treated, and a record was kept of the pulse, temperature, weight, and number of nights during which enuresis occurred. No other change was made in the child's mode of living, and no other treatment was employed. Of the twenty-eight cases, fourteen showed a marked improvement, two were cured, twelve did not improve. For purposes of comparison the cases were divided into two groups—(*a*) those with improvement, (*b*) those without improvement. The especial feature in group (*a*) was the number of backward children it contained—twelve out of sixteen—as compared with two out of twelve in group (*b*). The cases which appeared to react best to this form of treatment were those in which the enuresis had persisted since birth, and in which the patients were also backward. The initial dose administered was gr. $\frac{1}{4}$ or $\frac{1}{2}$ daily, and the rate of increase varied considerably. In the unsuccessful cases the treatment was abandoned when a dose of gr. 2 in twenty-four hours failed to produce even slight improvement. Firth thinks that in certain cases thyroid may be used with more confidence than any other drug, with the exception of belladonna.

Ruhräh refers to the use of **Hypnotism** in this condition, as practised by Voisin.[7] The latter has reported a case of a boy aged thirteen, who sometimes passed his urine while dreaming of the act. After several trials, Voisin put the boy into a hypnotic sleep and suggested that he would not dream any more. This was followed by abeyance of the incontinence for six days. He was hypnotized again, and the same suggestion was used; this was successful only for three days. Voisin then injected serum beneath the dura by lumbar puncture on three different occasions, and thereafter continued hypnotic suggestion once a week. The patient has been well for over a year.

Geronville,[8] according to Ruhräh, has devised a simple contrivance which has been very useful in certain cases. He places in the bed under the child's pelvis two metal plates separated by a piece of flannel or absorbent cotton. These are connected with wires each to one pole of a battery and a bell. When the child begins to micturate and the flannel becomes wet, the circuit is completed and the bell rings. The child wakes, and the micturition is stopped. After being awakened in this manner several times, the patient is frequently cured. A modification consists in having the apparatus arranged to give a slight electric shock on the child's abdomen.

Ruhräh mentions the treatment by injection of **Salt Solution.** Cathelin has suggested that this should be done directly into the spinal canal by lumbar puncture, or subcutaneously in the sacral region. Jaboulay has recommended retro-rectal injection of 100–150 grams of salt in solution, and Cahier has used between 60 and 70 grams, making the injections into the perineum about half an inch from the mid-line. Lozano and Forès have used the epidural method with

success, injecting the solution into the spinal canal, low down in the sacral region.

Of the older methods of treatment, Ruhräh lays stress on a few. He advises a simple **Non-irritating Diet** and **Restriction of the Fluid** taken, especially in the evening. In some cases, **Raising the Foot of the Bed** is useful, by preventing the first urine which enters the bladder from exciting the irritable mucous membrane near its neck. Some cases are improved by a large amount of rest, and by leading a quiet life.

In the absence of any other indication, he has found **Atropine** to give better results in a greater number of cases than any other therapeutic measure. It must be given in full doses. In nocturnal cases a dose at five o'clock and at bedtime is all that is required. In those in which enuresis is diurnal also, it is better administered every three hours. He usually prescribes a solution containing gr. 1 of atropine sulphate in 2 oz. of water. Each drop of this solution represents approximately gr. $\frac{1}{1000}$ of atropine, and ordinarily about as many drops will be required at a dose as the child is years old. He increases the dose until flushing of the face occurs about twenty minutes after the drug has been given; he then diminishes it by 1 min., and continues with this dose until the micturition at night has ceased, and for at least two weeks afterwards. He then gradually weakens the dose, diminishing it by 1 min. each day.

REFERENCES.—[1]*Amer. Jour. Med. Sci.* 1912, i, 186; [2]*Monat. f. Psychol. u. Neurol.* 1905, xv, 113; [3]*Bull. de Soc. de Pedia. de Paris*, 1909, 339; [4]*Neurol. Zentralb.* Nov. 1, 1983; [5]*Lancet*, 1909, i, 1245; [6]*Ibid.* 1911, ii, 1619; [7]*Rev. de l' Hypnotisme et de la Psychol. Physiol.* 1908-09, xxiii, 247; [8]*Rev. Prat. d. Mal. d. Org. Gén.-Urin.* 1909-10, vi, 59.

EPIDIDYMITIS. *Priestley Leech, M.D., F.R.C.S.*

Traumatic Epididymitis.—Edwards[1] records two cases where he was convinced that epididymitis was caused by strong muscular exertion. Many writers have ascribed this "*strain epididymitis*" to the sudden contraction of the cremasteric muscle, which is seldom very strong. He suggests that the small venules of the epididymis and testicle may rupture under the stress of effort, even if the vessels are healthy. No other explanation but this hæmorrhagic theory would satisfactorily account for the gradual development of the inflammatory exudate, and afford a reason why the pain of "strain epididymitis" should be slight at first and slowly and gradually increase.

Examination of the urine for pus, threads, and gonococci or tubercle bacilli must be made before deciding that strain is the sole cause of an epididymitis. This may be important in cases under the Workmen's Compensation Act; so also is the conclusion to which Moly[2] comes, that the existence of a true traumatic orchitis is proved beyond doubt. If a testicle is injured and inflammation follows rapidly, there is traumatic orchitis even if an epididymitis of gonococcal origin accompanies the lesion. The danger of subsequent atrophy is the same as in a simple contusion, and the

treatment is, similarly, **Incision** of the tunica albuginea, if there is hypertension.

Tuberculous Epididymitis.—Barney[3] has investigated this disease in 120 patients.

Etiology.—In 45 per cent of the cases the age of the patient was between twenty-five and thirty-five. Sixty per cent were married. In 30 per cent both organs were diseased at the time of entrance into hospital. Out of ninety-five patients, forty-three had had some minor surgical interference in an effort to cure the disease, usually tapping of the accompanying hydrocele and in some cases lancing of the abscess. As possible exciting causes, gonorrhœa and trauma were inquired for; the latter is of small import, as it was found only in eighteen out of a possible ninety-two. Out of a possible ninety-five, only thirty-four (35 per cent) confessed infection with gonococci; this percentage is probably too low.

Symptoms.—Pain was present in 60 per cent, and more or less wasting in 80 per cent. Unless there is an acute exacerbation, the pain is mild in character, with some tenderness. The scrotum was adherent, with or without fistula, in 67 per cent of the epididymes, while sinuses were observed in 53 per cent. Fever is absent as a rule; in only ten cases was the temperature over 100° F. before operation, and these cases were in a stage of acute exacerbation. Barney believes that the origin of the epididymal infection is the *prostate*. In 64 per cent there was no demonstrable evidence of tubercle elsewhere than in the prostate. Tuberculous infection in the past, presumably cured, was found in only 6 per cent. In 29 per cent, active tuberculosis was noted. In 69 per cent, the prostate was clearly tuberculous.

Treatment.—Two patients died in the hospital of general miliary tuberculosis, within a month of operation, which served as a torch to light up the infection. He does not think orchidectomy is justifiable. Out of fifty **Epididymectomies,** single and double, with and without vasectomy, no relapse in the testicle itself has been found. The other epididymis is often affected later on, and this is another reason for not removing the testicle.

In a further communication, Barney[4] deals with the end results of seventy-one of the 153 cases, sixty-nine of which had one or more operations. He draws the following conclusions: (1) After removal of one or both epididymes, the large majority of patients are found to be in good condition and to have gained weight; (2) In two-thirds of the cases there is no demonstrable evidence of tuberculosis elsewhere than in the genito-urinary tract. When present, it is most commonly found in the lungs or bones, but any organ may be attacked; (3) Renal tuberculosis rarely follows an infection of the epididymis; (4) Tubercle bacilli were present in eight out of ten urines as shown by the guinea-pig test. These urines also contained pus and blood, while those giving a negative reaction were normal; (5) A small majority of cases have a normal urine and no urinary disturbance before or after operation; (6) Post-operative sinuses are found in

25 per cent of the cases. He thinks tuberculin after operation hastens convalescence and the closure of sinuses more than any other measure ; (7) No case of epididymectomy is known to have had a recurrence in the corresponding testicle ; (8) Tuberculosis of prostate and vesicles is found in more than half, and probably this number would be greater could early and centrally-located lesions be discovered ; (9) In a very large majority the sexual function is undisturbed, but the semen is found to be sterile in 85 per cent ; (10) The mortality is 5·47 per cent, the cause of death being a general miliary tuberculosis ; (11) Comparisons between orchidectomies and epididymectomies show the latter to have resulted more favourably. It is a fact that infection of the second epididymis is to be expected whether an operation has been performed or not, and whether orchidectomy or epididymectomy has been done.

References.—[1]*Brit. Med. Jour.* 1912, i, 852 ; [2]*Sem. Méd.* 1911, 493 ; [3]*Boston Med. and Surg. Jour.* 1911, ii, 913 ; [4]*Ibid.* 1912, i, 409.

EPIDIDYMITIS, GONORRHŒAL.

(*Vol.* 1912, *p.* 308)—According to some writers, this is one of the forms of gonococcal infection which is most amenable to **Vaccine** treatment. (See also Gonorrhœa.)

EPILEPSY. *Purves Stewart, M.D., F.R.C.P.*

Treatment.—At Philadelphia (the home of one of the strongest neurological schools in America), a number of distinguished neurologists took part in an interesting discussion on the treatment of epilepsy.

Weir Mitchell[1] holds that bromides are useless in certain cases of minor epilepsy, which sometimes respond favourably to some of the **Coal-Tar Products.** Moreover, certain cases of epilepsy are even aggravated by bromides. He has not found any great difference as regards efficacy between the various salts, nor any special value in mixing them. For rapid action and for soothing purposes, he is of opinion that **Lithium Bromide** is the best. In regard to the dosage, he recalls their well-known deleterious effects, and emphasizes the desirability of giving just that amount of bromide which, being added grain by grain on the return of attacks, will finally prevent their recurrence. During this partial and gradual increase there is always the liability to bromism, with its anergia, impairment of memory, low spirits, sometimes even maniacal excitement, and suicidal or homicidal mania. In such cases, Weir Mitchell says it is sometimes better for a patient to have epilepsy than severe bromism. Although the effects of bromide on the skin are annoying, they may generally be avoided if the patient will take full doses of **Arsenic** and use **Hot Baths.** At the end of two years without an epileptic attack, the bromide should slowly be withdrawn again, grain by grain. **Silver Salts** have been practically given up for many years, owing to the marked pigmentation of the skin produced. One sort of silver salt, however, is stated not to produce pigmentation, viz., the **Ioduret,** but it is rarely prescribed.

As regards the treatment of *individual attacks* of epilepsy, this is only possible when a sufficient interval elapses between the commence-

ment of the aura and the onset of unconsciousness. Some expedients are venerable in their antiquity, e.g., putting salt on the tongue, tying a ligature around the arm, and so on. Such local stimuli are chiefly of value when the aura is correspondingly localized, e.g., when a fit is of the Jacksonian type, or when it originates in a sensation confined to one particular limb. **Nitrite of Amyl** is sometimes of the utmost value, and if the aura gives adequate warning, the inhalation of this drug often arrests the fit. The great pallor of the face which ushers in some fits suggests its probable mode of action by producing dilatation of the cerebral vessels, which are probably in a state of contraction at the onset of the fit. A simple expedient may sometimes be efficient, e.g., taking a long inhalation, holding the nose, and then forcibly contracting the chest for a number of seconds. This flushes the face, and in all probability the brain, just as amyl nitrite does.

Dercum[2] emphasized the fact that the great majority of epileptic patients present the stigmata of retarded or aberrant development, e.g., deformities of the skull, palate, teeth, ears, digits, etc. Similar morphological anomalies are also frequently present in the brain. Many years ago, Dercum showed a series of twelve epileptic brains, all of which showed more or less striking anomalies of convolutions and fissures. He considers it probable that there is not only a morphological abnormality, but also an error of metabolism, and that the epileptic patient suffers from the formation and retention of toxic substances.

He divides the treatment of epilepsy into physiological, and medicinal. *Physiological treatment* includes elimination of waste and toxic substances, exercise, diet, and the maintenance of a high level of physical and mental health. Dercum restricts the amount of red meats and gives mainly a lacto-vegetarian diet. As regards *medicinal treatment*, he still pins his faith to **Bromides** in some form or other, their efficacy being enhanced by the **Withdrawal of Sodium Chloride** from the food. The patient, as a rule, becomes rapidly accustomed to the absence of common salt, but in certain cases there may result a marked loss of appetite and corresponding loss of weight, in which case a certain amount of sodium chloride may be allowed again. He strongly urges the addition to the bromide of one of the glycero-phosphate salts, preferably **Sodium Glycerophosphate,** on the ground that there is an increased waste of phosphorus in epileptic patients. The Flechsig method of treatment, consisting in the administration of **Opium** in increasing doses daily for a period of five or six weeks, after which time it is suddenly withdrawn and bromide given in full doses, sometimes proves efficient when the bromides by themselves fail to control the fits. **Thyroid Extract** appears to have a real though limited value. Dercum considers it specially applicable for epileptic children with marked stigmata of arrested development, and signs pointing to thyroid deficiency. It should be combined with bromide. He agrees with Weir Mitchell as to the value of amyl nitrite in the arrest of epileptic fits where the aura is sufficiently prolonged to allow of its administration.

Taylor,[3] who had been associated for many years with Keen in his cerebral surgery, considered that essential or idiopathic epilepsy of non-traumatic type, where the attacks are general and without local onset, are entirely unsuitable for operation. On the other hand, epileptic fits with focal symptoms should be explored in the region of the corresponding cortical area, the dura mater being incised and the surface of the brain carefully examined for evidence of cyst, new growth, or localized meningeal inflammation. He recommends a wide opening in the skull, preferably by an osteoplastic flap.

Shanahan,[4] the superintendent of the well-known Craig Colony for Epileptics, lays great stress upon **Institutional** treatment. He considers that medicinal treatment is of minor importance compared with strict dietetic and hygienic measures. The bromides are of use merely by diminishing the frequency and severity of the seizures. He finds **Sodium Bromide** the most satisfactory salt to prescribe, more elegant preparations of bromine being **Bromipin, Bromoglidine, Brometone, Sabromin, Brovalol,** etc.

When epilepsy appears for the first time after twenty years of age, syphilis must always be considered in searching for the exciting cause. If positive evidence is obtained, **Salvarsan,** supplemented by **Mercurial** treatment, should be administered. The majority of epileptic patients suffer from intestinal stasis, and drastic **Catharsis** has been found of great value amongst the epileptics at Craig Colony. Shanahan is strongly against the marriage of any epileptic, and considers that it should be prevented by every possible means. Statistical observations on female epileptics lead him to the conclusion that the alleged relation between the menstrual function and the fits has been largely exaggerated. The confirmed epileptic should live in a special institution, where he can be suitably cared for and permitted privileges not available for him in the outside world.

Frazier[5] records his experience of twenty-five cases of epilepsy treated by **Operation.** Of these a relatively large proportion—seven—showed highly satisfactory results. In almost half of the cases he found well-marked œdema of the subarachnoid space on the surface of the brain, a condition to which attention has also been directed by Alexander,[6] of Liverpool. He agrees, however, that Jacksonian cases, and cases with a localized aura, are more suitable for operation than general epilepsy without focal signs. The cases suitable for surgical interference are: (1) Traumatic epilepsy with external evidence of a cranial injury; (2) Traumatic epilepsy without external evidence of injury, but where the nature of the attacks, or the symptoms immediately following the injury, indicate the seat of the lesion; (3) All forms of Jacksonian epilepsy of whatever origin; (4) General epilepsy where the suggestion of a focal lesion may be indicated by some disturbance of motor, sensory, or reflex functions.

In spite of experience with various medicinal remedies, **Bromide Salts** in some form or other still remain the sheet-anchor of most therapeutists. The ordinary bromides possess certain disadvantages: the

salt taste, the production of energia, dyspepsia, etc., and the well-known complex of symptoms known as bromism, with its physical and mental dullness and inveterate acne. In order to overcome these undesirable symptoms, numerous modifications of bromide have been introduced with varying success. Of these **Bromipin** is perhaps one of the best known. Readers of the MEDICAL ANNUAL will also remember that bromism is diminished by adopting a special **Salt-free Diet** in combination with smaller doses of bromide, as originally suggested by Toulouse and Richet. According to these observers the withdrawal of chlorides from the diet renders a smaller amount of bromide efficient in controlling the fits. The re-administration of sodium chloride causes rapid elimination of the bromide and may, in cases of obstinate bromide acne, cause rapid disappearance of the eruption. Many writers believe that this withdrawal of chloride is almost as important as the presence of bromide. This statement, however, is far from universally accepted, and most clinicians prefer to rely on the administration of some salt of bromine, which should, if possible, be free from the undesirable toxic effects of the ordinary bromide. Merck's recent preparation, **Zebromal,** contains a relatively small proportion of bromine (48 per cent) as compared with sodium bromide (78 per cent), and is insoluble in water, but soluble in alcohol, ether, or chloroform. It is free from disagreeable taste. Jodicke[7] has employed it in twenty-one cases of epilepsy for periods varying from one to six months. With few exceptions the patients had previously been treated for months or years with sodium or potassium bromide, with varying success. It was thus possible to compare the effects of the new remedy with those of the ordinary bromide salt. A relatively large dose is necessary. Each tablet contains 1 gram (gr. 15). Cases which had previously required 3 grams of sodium bromide were therefore started with 4 or 5 grams of zebromal. The results appear to have been satisfactory, and in particular, no disturbance of digestion, no drowsiness, and no cutaneous rashes were observed. The remedy is given in tablets which the patient chews and swallows.

In 1908, Self,[8] of Clairette, Texas, reported the case of a man, aged thirty-five years, who at the age of thirty-three was bitten by a rattlesnake. For fifteen years previous to this accident he had been subject to epileptic fits, from which he had been free after his snake-bite, up to the time of publication, two years later. Spangler,[9] of Philadelphia, accordingly decided to try the effect of an artificial bite by means of the hypodermic injection of a solution made from the dry glycerinized venom of the rattlesnake (*Crotalus horridus*) in epileptic patients. The dose of the dried crystallized venom, **Crotalin,** which is best dispensed in sterilized ampoules, varies from gr. $\frac{1}{200}$ to $\frac{1}{50}$. The solution is injected intramuscularly into the forearm, choosing opposite limbs, turn about, on successive occasions. A local reaction occurs. In from fifteen seconds to two minutes after the injection, a burning and stinging sensation appears. In from five minutes to an hour, a hyperæmic area about the size of a silver dollar is noticed on the

skin at the site of injection. The stinging sensation continues, and in from two to six hours the erythema and cellulitis have still further extended, the forearm becoming swollen, purplish-red, and hot to the touch. The pain and burning may be relieved by an ice-bag, or better still by a saturated solution of magnesium sulphate. Ten or a dozen layers of gauze are laid on the affected area, and are kept wet by the magnesium sulphate solution. The pain, swelling, and cellulitis reach their maximum in twenty-four to thirty-six hours, and then gradually subside. By the third or fourth day the local symptoms have disappeared, and the limb regains its usual appearance. On the sixth or seventh day another injection is given in the opposite forearm, and so on. With subsequent injections the local reaction becomes less marked, and the strength of the doses is gradually increased. Spangler starts with gr. $\frac{1}{200}$, and gradually increases the amount. The largest dose given by him has been gr. $\frac{1}{12}$. This was after the patient had received progressive weekly injections for four months. It is important to determine the susceptibility of each patient to the serum, and to regulate the dose accordingly. The idiosyncrasy is judged by the local reaction at the site of injection, and by the effect on the character and frequency of the fits. Patients vary in their local reaction, and even in the same patient variations are noticed from time to time, so that at times gr. $\frac{1}{200}$ will cause a more severe local reaction than gr. $\frac{1}{50}$ at another time. The production of a marked local reaction is essential for the success of the treatment. An ordinary mixed diet is allowed, but the bowels are kept rather loose by means of laxatives. Bromides and other anti-epileptic drugs are rapidly or suddenly withdrawn.

In his original paper, Spangler recorded 11 cases treated by the above method, and in a subsequent article dated a year later,[10] he brings the number up to 36, in which the length of treatment had varied from two years to three months; 21 were male and 15 female patients. Epileptic attacks had occurred for periods varying from twenty-five years to six months before the venom treatment. Six cases had been under treatment for over two years, and 16 cases for eighteen months down to eight months. In several of the most satisfactory cases the interval between injections had been lengthened to ten to fourteen days, and one patient had only had injections once a month for the past year.

Spangler claims that in idiopathic epilepsy (carefully excluding cases of gross organic cerebral disease or injury, also uræmic, eclamptic, or alcoholic cases), the course of the disease is profoundly modified. In addition to diminution in the number and severity of the attacks, the mental depression and feeling of apprehension are changed to cheerfulness, and the post-epileptic headache is much less intense, even in cases where convulsions occur. The general health is also stated to have improved in all the cases.

Spangler admits that part of these phenomena may have been due to the withdrawal of bromide medication. On scrutinizing his

statistical tables it is seen that in only 3 cases out of 36 did the fits cease, but that in most of the others the frequency of the attacks was markedly diminished, e.g., in one case, from daily attacks before treatment to one every five to twelve weeks; in another, from one to two major attacks weekly, to minor attacks only at intervals of two to three weeks.

Combined Glandular Extracts (*page* 30), and **Ureabromin** (*page* 44), are said to act beneficially in epilepsy.

REFERENCES.—[1]*Therap. Gaz.* 1912, 153; [2]*Ibid.* 157; [3]*Ibid.* 164; [4]*Ibid.* 165; [5]*Ibid.* 171; [6]*Lancet*, 1911, ii, 932; [7]*Münch. med. Woch.* 1912, 354; [8]*Med. World*, 1908, June 30; [9]*N.Y. Med. Jour.* 1910, ii, 462; [10]*Ibid.* 1911, ii, 517.

EPITHELIOMA, BENIGN CYSTIC. *E. Graham Little, M.D., F.R.C.P.*

The resemblances between the disease named above, and two others, adenoma sebaceum and lymphangioma tuberosum multiplex (all being exceedingly rare diseases), are the subject of a paper by Sutton,[1] who observed in two negroes an example of the first two affections. Histological examination demonstrated the nature of the lesions, which have not been previously recorded in the negro race.

REFERENCE.—[1]*Jour. Cut. Dis.* 1911, 480.

ERYSIPELAS.

Turpentine has been injected to produce an "abscess of fixation" (*page* 43).

(*Vol.* 1912, *p.* 267)—Choksy finds that gauze compresses soaked in a saturated solution of **Magnesium Sulphate** give remarkable relief. The dressings should be wetted every two hours with the solution, covered with oiled paper, and removed for inspection once in twenty-four hours.

ERYTHEMA COMPLICATING INFECTIOUS DISEASES.

E. W. Goodall, M.D.

During most of the acute infectious diseases there may occur a certain group of symptoms, the most striking of which is an erythematous rash. This assumes various forms: macules, papules, patches of punctate erythema (scarlatiniform), urticaria, and erythema marginatum. But though the form is variable, the distribution is singularly constant. It affects the extensor surfaces of the limbs, especially over the joints and the buttocks, less often the trunk, rarely the face. The other symptoms which accompany it are pyrexia, vomiting, diarrhœa, rapid and feeble cardiac action, lowering of the arterial tension, enlargement of the liver, and prostration. But it is not to be thought that in every case in which there is a rash all these symptoms are present. Some may be wanting; indeed, in a few cases, beyond the rash, there is no symptom, save, perhaps, slight pyrexia.

ETIOLOGY.—For upwards of twenty years these secondary, or "accidental" rashes, as they have been termed in this country, have engaged the attention of writers both here and on the Continent, and

recently Hutinel[1] has returned to a discussion of their significance and pathology in a paper entitled, " Erythèmes avec syndrome malin dans les maladies infectieuses." At one time the appearance of this form of erythema was looked upon as of very grave import, but Hutinel points out that prognosis must be guided, not by the rash but by the character of the accompanying symptoms ; that the rash is, so to speak, quite an accident.

Another question discussed is, Are these erythemas infectious ? That they are so is suggested by the fact that they have been known to occur in groups. On the other hand, sporadic cases are the rule, and in this country their infectious character has never been admitted. It was at one time suspected, if not believed, that they were due to the action of streptococci ; but as various organisms have since been found associated with them, they cannot be attributed to any special one. In fatal cases the liver and kidneys are nearly always enlarged, and are the seat of fatty degeneration, while the adrenal bodies and pancreas have undergone certain degenerative changes to which French pathologists attribute much significance. It is believed that the lesions are brought about by the action of bacterial toxins.

While these secondary rashes may be found in most of the acute infectious diseases, they are most common in scarlet fever, typhoid fever, and diphtheria. In the last disease they must not be confused with rashes produced by antitoxin. They seldom give rise to any difficulty in diagnosis, but occasionally they may simulate measles. Sometimes they are seen in connection with septic inflammation and ulceration of the fauces.

Treatment.—Hutinel recommends **Adrenalin,** 1–1,000 solution, 6 to 8 minims daily, for grave cases in which prostration is marked.

Reference.—[1]*Presse Méd.* 1912, 213.

ERYTHEMA NODOSUM.

Melubrin, a new salicyl compound, is recommended (*page* 23).

ERYTHEMA NODOSUM SYPHILITICUM.

E. Graham Little, M.D., F.R.C.P.

Thirty years ago Mauriac described a form of lesion closely resembling erythema nodosum, but of syphilitic causation. The observations remain very infrequent, and this condition is very liable to be mistaken for rheumatism or Bazin's disease (erythema induratum). It is a malignant form of syphilis, of early tertiary type, and is frequently preceded, accompanied, or followed by formation of gummata. It is probably hæmatogenous in origin, and due to the specific organism which may be found in the lesion.

Leviseur[1] has collected and commented on the recorded cases which have these points in common : numerous bullet-shaped painful infiltrations appearing suddenly in the subcutaneous tissue, with hyperæmic areolæ, symmetrical arrangement, and localization on the lower extremities. They are strikingly like the lesions of erythema

nodosum, but they do not respond to salicylates. Antisyphilitic treatment lessens the pain, which is very severe; but the tumours tend to break down and are an intractable form of the disease. The pathological process begins with phlebitis.

REFERENCE.—[1] *Jour. Cut. Dis.* 1911, 579.

EXOPHTHALMIC GOITRE. (*See* GOITRE.)

EYE, GENERAL THERAPEUTICS OF. *A. Hugh Thompson, M.D.*

Tuberculin.—Mackay[1] recommends Koch's new tuberculin (T. R.)—human or bovine—as the safest preparation, the bacillary emulsion (B. E.) being reserved for cases where a more powerful effect is desired.

The two chief *methods* employed in eye cases have been Wright's, in which, commencing with a small fraction, $\frac{1}{8000}$ to $\frac{1}{10000}$ mgram, the dose is gradually increased over a prolonged period of treatment at about ten days' interval between each inoculation, and the dosage is regulated by the phagocytic index; and von Hippel's, commencing with an initial dose of $\frac{1}{5000}$ mgram of tuberculin T.R., the inoculation being repeated on alternate days and increased each time by $\frac{1}{5000}$ mgram until a dose of $\frac{1}{50}$ mgram up to $\frac{1}{5}$ mgram, then by $\frac{1}{10}$ mgram until 1 mgram is reached. If during the treatment the temperature rises above 100° F., the previous dose or a smaller one is repeated, until there is no rise of temperature after the inoculation.

INDICATIONS.—The question of the tuberculous nature of phlyctenular disease is a vexed one. Mackay expresses happily the general opinion by saying that he does not regard phlyctenules as a hall-mark of tuberculosis. He would rather say that in the human mansion they constitute a sign of "apartments to let for tubercle." The cases in which he has had specially good results with tuberculin include irido-cyclitis with punctate keratitis, cases of interstitial keratitis which respond to von Pirquet's test, and some cases of muscular paralysis.

Salvarsan.—The following notes of a discussion on the ophthalmological application of the new remedy at the 1912 meeting of the British Medical Association,[2] may be taken to represent fairly current experience in the ophthalmic world.

Stephenson (London) thought that the remedy was best given in series by the intravenous route, and was of opinion that it should be supplemented by mercurial inunctions. Marple (New York) had used salvarsan in interstitial keratitis, and in specific iritis accompanied with a gumma or papule of the inflamed iris. In the former disease it had little effect, while in the latter it acted admirably.

Igersheimer (Halle) said he had had much better results in interstitial keratitis since he had employed not one but several injections of salvarsan. For example, improvement resulted in 5 per cent of his 39 cases from a single injection, in 25 per cent of 24 cases from two injections, and in 36 per cent of 11 cases from three injections. He had seen good results follow the administration of salvarsan in recent disease of the retina and optic nerve, whether due to acquired or

inherited syphilis. It often acted excellently in inflammatory affections of the uveal tract. In three cases of ocular paralysis, good results were obtained. In several cases of interstitial keratitis a single injection of **Neosalvarsan** yielded results that he had never seen from a single injection of salvarsan.

In Maitland Ramsay's (Glasgow) experience there was no difference in the therapeutic results obtained by salvarsan and neosalvarsan respectively. His experience supported the view that the most trustworthy results were obtained when salvarsan was combined with a course of mercurial treatment. In the cure of syphilis, **Mercury** was as necessary now as it ever was. The value of salvarsan lay in its power of destroying the spirochætes before they had time to damage the delicate structures of the eyeball.

Bishop Harman (London) described the procedure at Moorfields Hospital. The patient was prepared as for a major operation, and two or three intravenous injections were given at intervals of a week. He had not been able to find any advantage from its use in interstitial keratitis, even with three injections in a recent and acutely vascular case. Again, it had failed in a case of rapidly advancing choroidoretinitis; but so also had mercury. He acknowledged its successful influence in acute iritis, but did not advise it in such single ocular lesions as were readily amenable to other and completely harmless measures. The case was different when general symptoms of the disease existed. In acute cyclitis with rapidly increasing vitreous opacities, and in syphilitic optic neuritis, its use was warranted, for rapidity of treatment was essential.

Nimmo Walker (Liverpool) mentioned four cases which had caused him to hesitate to use salvarsan: a case of interstitial keratitis, one of gummatous iritis, one of papillitis, and a fourth of acute retrobulbar neuritis with myelomalacia, in all of which the disease had followed the use of salvarsan. Whitehead (Leeds) said that in his experience the results in acute iritis were striking and satisfactory: one case of syphilitic retinitis recovered rapidly. On the other hand, only two out of thirty-seven cases of interstitial keratitis showed any improvement.

Pockley (Sydney, N.S.W.) had tried salvarsan in many cases of interstitial keratitis, but had never got any better results than with mercury and atropine.

A new application for salvarsan was commented on by Browning,[3] viz., in the treatment of sympathetic ophthalmitis. It has been found that the blood in these cases shows a marked increase in the number of large mononuclear leucocytes. Browning said he had treated about seventeen cases of sympathetic disease with salvarsan, and always with a more or less similar result. "The count approaches the normal again, and the eye becomes quiet. I cannot say, however, that any case has been cured so far, except perhaps three cases in which the diagnosis, apart from the blood-count, was not certain, but I think the facts that the blood approaches the normal, and that the eye condition is much relieved, are suggestive."

Carbon Dioxide Snow.—This appears to be one of the newer methods of treatment that have come to stay. In eye work it is especially indicated in the treatment of *nævi*. In *rodent ulcer*, Mitchell[4] says it has been found that by persistently applying snow to the raised edges of these growths, the cure is much more readily effected than by applying it all over the diseased area at each sitting. As long as there is a good scab in the centre of a healing rodent ulcer, and this can be kept clean, so long will the freezing of the edges—which are always advancing inwards—hasten the cure in the most rational manner. The freezing of the centre need not be done more than two or three times in the treatment.

Trachoma is also relieved, and in some cases cured, by this treatment. At Moorfields it has been found that the application of CO_2 snow to the conjunctiva covering the upper tarsal plate was sufficient to bring on a violent vascular reaction in the whole conjunctiva, and the beneficial results must be attributed chiefly to this inflammatory reaction. In *spring catarrh*, an absolute cure was obtained in a long-standing case by three applications of fifteen seconds to the conjunctiva of each upper lid. Mitchell gives directions for the technique of this procedure which has the advantage of cheapness, no expensive apparatus being required (*vide* also MEDICAL ANNUAL, 1911, p. 306).

Subconjunctival Injections.—E. L. Jones,[5] who professes himself a disciple of Darier (*vide* his " Ophthalmic Therapeutics "), spoke highly of this method. " In inflammatory troubles they are antiphlogistic ; in indolent conditions they increase circulatory activities ; in septic troubles they check sepsis, and where sepsis is impending, prevent it. In specific troubles they avail much, but surely not by reason of the small amount of specific drug in them." " My practice is invariably to use as much as 2 c.c., or 30 min., of fluid, regardless of its composition, age or condition of patient, or nature of disease or injury, as I believe it is the distension and flushing of the lymph-channels that is one of the chief essentials of success."

Like Darier, Jones recommends a 1–5000 solution of **Cyanide of Mercury.** To combat the pain caused by the injection, he finds that acoin, though useful, is not sufficient, and for the past five years has regularly put gr. $\frac{1}{8}$ of morphia and a like amount of dionine, into the injection fluid in cases not already painful, and gr. $\frac{1}{4}$ in conditions already severely painful, as glaucoma. Though making such high claims for this method, he admits that by far its largest use is to be found in advanced or dangerous cases of corneal ulceration.

In the discussion that followed the paper, the three chief objections to the method were pointed out by various speakers : excessive reaction, which, though it may be alarming, is not as a rule dangerous ; excessive pain, which in some cases admittedly calls for morphia ; and adhesions of the conjunctiva to the sclera caused by the injections.

Subconjunctival injections of **Dionine**—20 to 60 min. of a 5 or 10 per cent sterile solution—were recommended by Bulson, especially for septic conditions and for intra-ocular hæmorrhage. The swelling is

even greater than when other solutions are used, but the discomfort is said to be practically nil.

Iodine.—The following solution is recommended by Meierhof[6] for ulcers of the cornea: Iodine gr. 1, sodium iodide gr. 3, in 1 oz. of water. Three drops of this solution are instilled into the eye three or four times daily. The instillations are somewhat painful. By this method he has treated with success fifteen patients with erosive ulcers and ulcers in connection with trachoma.

REFERENCES.—[1]*Brit. Med. Jour.* 1912, ii, 1026; [2]*Ibid.* 1036; [3]*Ophthalm.* 1912, 629; [4]*Brit. Med. Jour.* 1911, ii, 1176; [5]*Jour. Amer. Med. Assoc.* 1912, ii, 992; [6]*Ibid.* 1911, ii, 735.

FACE, PLASTIC SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Jacobovici[1] gives the following rules for the formation of flaps: (1) The pedicle of the flap must be near to the loss of substance;

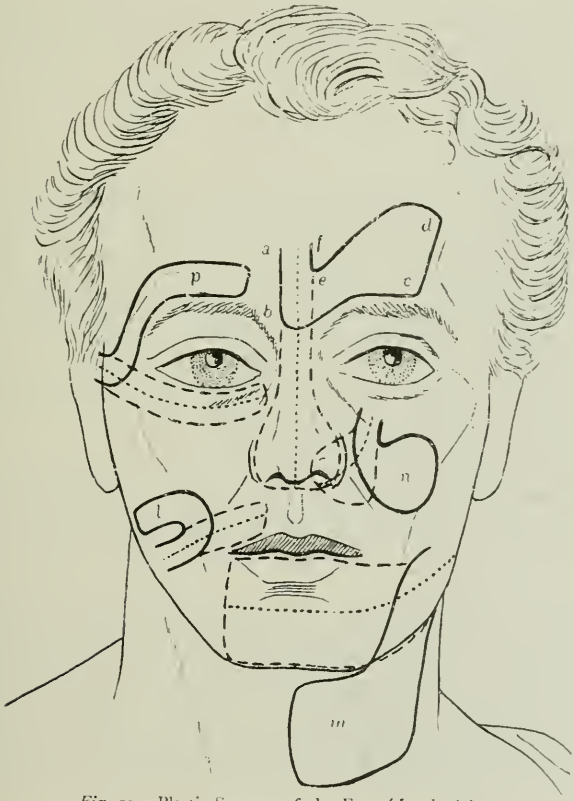


Fig. 53.—Plastic Surgery of the Face (*Jacobovici*).

(2) The long axis of the pedicle must correspond to the long axis of the flap in its new situation; (3) When cutting the flap care must

be taken that it is near the pedicle or that it is a continuation of it ; (4) There need be no fear that the long axis of the flap is too curved, for in virtue of the elasticity of the skin the detached flap takes the desired direction (*Fig.* 53). The illustration is kindly lent by *La Semaine Médicale.*

REFERENCE.—[1]*Sem. Méd.* 1911, 613.

FÆCES, EXAMINATION OF. *Oskar C. Gruner, M.D.*

Occult Blood.—Zoeppritz[1] gives the following method of carrying out the guaiac test :—

Ten to 15 c.c. of fæcal matter are rubbed up with water in a porcelain basin and then treated with one-third to one-half volume of glacial acetic acid. The extract is poured into a test tube and 3 to 5 c.c. ether added. After inverting several times, the ether is poured off into another test tube, and extremely finely-powdered guaiac resin added. This mixture is allowed to flow across a filter paper which has already had a line drawn across it with old turpentine oil. The two lines should cross at right angles. A pure blue will appear at the zone of contact.

Newbold[2] found that melon pulp in fæces will give the characteristic reaction for blood.

Parasites.—Sistrunk[3] takes the following precautions. The patients are given ½–1 oz. of Epsom salts before breakfast on the morning of the examination. After breakfast, they wait in the laboratory. The motion is collected here and examined at once. A wet slide preparation is made and examined with a warm stage under the one-sixth lens, the warm stage being made of a strip of copper suitably heated. If the first movement is too solid, the patient must wait for a second or third. Watery stools are not suitable. The observations of this writer showed that all varieties of intestinal parasites may be met with even in people who have not been anywhere near the accepted sources of infection.

The quantitative *estimation of trypsin and amylase* in the fæces is of value in the detection of disease of the pancreas, especially if associated with a similar analysis of the duodenal contents (by Einhorn's duodenal pump). Details of the method employed may be found in a paper by Friedman.[4]

The errors arising in the detection of *ferments in fæces* were studied by D. Gerganoff ;[5] the presence of blood, for instance, was found to interfere with the reaction, by causing an increased ferment action on its own account. This is especially the case in intestinal hæmorrhage. Should there be acid in the stomach, blood in the stools, and abundance of ferment, the conclusion would be that the hæmorrhage was from the duodenum, or from other parts of the intestine, and not from the stomach.

REFERENCES.—[1]*Münch. med. Woch.* 1912, 180 ; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 152 ; [3]*Ibid.* 1507 ; [4]*Med. Rec.* 1912, i, 355 ; [5]*Deut. Med. Woch.*

FALLOPIAN TUBE, DISEASES OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Inflammation.—Lock[1] has analysed the lesions in 100 cases of pelvic inflammation. In these a division may be made into groups according to the type of infecting agent and according as the extension is by the direct ascending or descending route. In the first are included all cases of puerperal infection, with the streptococcus as infecting agent, and extension by the direct method giving rise to pelvic peritonitis, ovarian abscess, or thrombophlebitis, infection of the tube as a rule only taking place at a later date.

In the ascending infection, where the organism may be the gonococcus or one of the pyogenic group, the result is a salpingitis terminating in pyosalpinx, hydrosalpinx, or chronic inflammation of the tube. This group occurs apart from the puerperium, and is a fertile source of sterility.

In the descending group are included all tuberculous affections, a study of which by Barbour and Watson[2] showed that the infection is most advanced in the outer dilated parts of the tube, and is in that situation confined to the mucous membrane, while the muscle wall is not affected. Nearer the uterus the lesion is still confined to the lining, but is less advanced, and at the uterine end the mucous membrane is free from infection, but there are nodules in the musculature. The authors argue that the lesion is due to the ciliated epithelium of the tube sweeping in tubercle bacilli which are free in the peritoneal cavity. In none of their cases was there any evidence of abdominal tuberculosis, but it is conceivable that the organisms may have been present in small numbers and have originated in mesenteric glands.

Pyosalpinx.—An instance of rupture is recorded by Brickner,[3] occurring in a woman while at stool, and causing acute general peritonitis. He has collected the recorded cases, and finds that out of 91, 54 died, but in only 55 had operative treatment been undertaken. The value of laparotomy in these cases, and within twenty-four hours of the rupture, is proved by the fact that of 28 patients operated on under this condition, only 3 died. The classes of infection which appear most liable are those of gonococcal and streptococcal origin. The ruptured tube should be removed at the time of operation if the patient's condition permits.

Salpingostomy.—Gellhorn[4] discusses the cases in which this operation is likely to be successful as a means of curing sterility. Gonorrhœal and tubercular cases are unsuitable, as in them the ciliated epithelium has been destroyed; and he would limit the operation to those cases in which the tubes are closed from peritonitic irritation following appendicitis or ectopic gestation, or to moderate degrees of hydrosalpinx. Three patients on whom salpingostomy had been performed have been again opened, but in only one has the tube been found patent.

REFERENCES.—[1]*Jour. Obst. & Gyn.* 1912, ii, 1; [2]*Ibid.* 1911, ii, 105; [3]*Surg. Gyn. & Obst.* 1912, May; [4]*Ibid.* 1911, July.

FASCIAL TRANSPLANTATION. (*See* GRAFTING.)

FAVUS.

(*Vol.* 1912, *p.* 77)—Exposure to **X-rays** appears to be a highly effective method of treating favus of the scalp.

FEET, SWEATING OF.

(*Vol.* 1912, *p.* 332)—Bathe the feet well every night with a warm 1 per cent solution of **Potassium Permanganate**; dry thoroughly. Next morning dust the feet with a powder containing powdered alum 20 grains, potassium permanganate 2 drachms, powdered talc 1 ounce, and half an ounce each of the carbonate and the oxide of zinc.

FEVER IN THE NEW-BORN. *Frederick Langmead, M.D., M.R.C.P.*

Cautley[1] contributes an instructive article on this subject. The temperature of the baby at birth is about equal to, or a little higher than, that of the mother, and oscillates about 99·5° F. Exposure, bathing, and lack of food quickly reduce it to 96° or 96·5° F., and it may not reach the usual level for three or four days in normal infants. It then ranges between 98° F. and 99·5° F., and shows a slight evening rise. The temperature range in the infant is easily upset. An occasional rise for a few hours has no special significance, but a daily rise, or the persistence of a temperature a degree above normal, is, according to Cautley, indicative of disorder.

ETIOLOGY.—A form of fever occurring in the first few days after birth has been called "*inanition or thirst fever*," because the temperature has subsided abruptly with the free administration of water or a plentiful supply of breast milk. Cautley believes that such cases may be explained by mild sepsis, the taking of fluid, if curative, acting by inducing elimination of toxins. Some cases he thinks may be due to intestinal or renal irritation, the absorption of abnormal intestinal products, the swallowing of liquor amnii or vaginal secretions, or nasal catarrh.

Injury at birth is an evident explanation of a few cases. *Sepsis* is, however, by far the most important cause. Cautley thinks that quite 50 per cent of the cases of fever in the new-born are so produced. About 25 per cent can be ascribed to gastro-enteric infection, but it is probable that many of these are really septic in origin and the alimentary affection is purely symptomatic.

The sources of septic infection are numerous, and may be *ante-natal* (maternal or congenital); *natal* (infected liquor amnii or vaginal secretions); or *post-natal* (dirty hands, scissors, ligatures, powders, dressings, bath-water, sponges, flannels, etc.). Often neither the source nor the portal of entry can be determined. Infection is occasionally by the mouth, but the cord and navel are the most important channels of infection. He describes a case in which the primary cause was apparently a pustular dermatitis. (Other writers have supposed infection possible through the healthy but newly desquamated skin, and have recorded examples of supposed infection from the middle ear and bronchial passages.—F. L.)

Cautley enumerates the septic processes to which the umbilical

region and cord are liable. The inflammation may start in the cord and extend through the navel, setting up arteritis or phlebitis. *Arteritis*, usually a *periarteritis*, is the more common. It induces pyæmia without jaundice, and ends fatally from pneumonia or asthenia. Pus may be squeezed out from the stump of the cord, and thickened arteries or an abscess may be found. *Phlebitis* rarely causes local signs unless accompanied by arteritis. It affects the umbilical vein, and gives rise to thrombosis, pus formation, and secondary hepatitis with progressive jaundice. Pneumonia and peritonitis are not infrequent, and are almost invariably fatal.

Symptoms.—Cautley recognizes various *types of septic infection*. Some are associated with sudden collapse without local signs; others with gastro-enteritis; others with cerebral and meningeal symptoms; others resemble pneumonia. A serious form is that leading to severe toxæmia with fever, greyish pallor, and hæmorrhages. He ascribes to septic infection certain other conditions about which opinions are more divided. Such are the "hæmorrhagic disease," and the affections named after Winckel and Bühl. Hæmorrhage after the second day of life, he thinks is almost invariably septic in origin.

Treatment.—The cord should be dressed properly, using dry antiseptic gauze and an antiseptic powder, such as starch containing 5 per cent salicylic acid. An even safer method is to disinfect first with rectified spirit. When symptoms arise, the treatment is symptomatic. **Chloral** he regards as the best drug for the relief of spasms. It can be given in doses of gr. 2 to 4 by the mouth or rectum, every two or four hours unless the child is asleep. Bromides are of much less value. **Hot Saline Rectal Injections** are useful in assisting elimination of the toxins. Subcutaneous injections of saline are needed in bad cases. If the stools are unhealthy, small doses of **Grey Powder** are beneficial. **Bismuth** in frequent doses is more useful for diarrhœa than astringents. **Brandy,** 2 to 5 min. or more, every two to three hours, he recommends for toxæmia and collapse.

Reference.—[1]*Brit. Med. Jour.* 1912, i, 1115.

FISTULÆ, TUBERCULOUS.

(*Vol.* 1912, *p.* 96)—Healing may be accelerated by **Zinc Ionization,** application being made by an anode of absorbent cotton soaked in a solution of chloride or sulphate of zinc. The local application of **Potassium Permanganate** crystals is also recommended.

FRACTURES. *Priestley Leech, M.D., F.R.C.S.*

Treatment.—Hitzrot,[1] after a study of a series of fractures, thinks that the most satisfactory functional result with the least danger will be obtained by **Non-Operative Reduction,** and the more experienced the profession becomes in their handling the better will be the results. Operation must be considered not as the method of election, but the method of selection for a carefully chosen group of cases; and in selecting the types for operation, each case must be considered on its own merits. He gives results of all the cases treated without operation, and

they are good. Deformity and disability are not always the result of improper replacement. The traumatism that caused the fracture may set up coincident joint changes which in rheumatic and gouty persons may be responsible for the bad results. Age must also play an important part in the result. Extension (supracondylar) fractures of the humerus in children never give any disability, and rarely any deformity, while the same lesions in the elderly result in marked disability, even with perfect reduction and no deformity. One fact has become evident from an analysis of these cases, viz., that early reduction before infiltration has occurred has given the best results. After-treatment is often neglected; massage should be begun as soon as the callus is solid enough to prevent displacement. In general, the earlier active and passive movement is begun within the limits of pain, the better the result.

Corwin[2] gives the results of thirty years' experience of fractures seen in the service of the Colorado Fuel and Iron Company. In those of *long bones*, 11,035 in number, perfect results were attained in 66·87 per cent, i.e., function has been restored and deformity is not objectionable; in these fractures, functional results are more important than anatomical accuracy. Simple fractures should always be treated, if possible, by external support; but if reduction be difficult to obtain and maintain, the open method should be resorted to. The patient's general condition must always be considered.

Lawrence Estes[3] has gone through 760 tabulated cases of fracture of the *shaft of the femur*. Working men between twenty and fifty years of age furnish a large share of the cases, and indirect violence is responsible for the majority. The middle third is the part most frequently broken; simple fractures far outnumber the compound and complicated ones. The average shortening before reduction was 1·38 in.

By far the most frequent method of treatment was by some form of Buck's **Extension**; the average weight used being fourteen pounds. [This is too little.—P. L.] The average reported shortening in completed cases was ½ in.; average time in bed, 8·2 weeks; average length of time incapacitated, 2·7 months [This is probably a mistake. —P. L.]; average length of time crutches, canes, or other aids in walking were used, 8 weeks. Most of the patients limped for some time; in a little less than a fifth of the reported cases there was inversion or eversion of the foot or tilting of the pelvis from serious axial displacements, and excessive callus in a little more than a tenth of the cases, producing some disturbance. Hospital surgeons, as a rule, do not pay enough attention to these cases, and are apt to leave them to the house surgeons.

Martin[1] has had good and bad results from the **Operative Treatment** of fractures, and has had some cases of infection. He has been obliged to remove some plates, one of which had given no trouble for five years. In discussing these results, stress was laid on carrying out Lane's technique in all its details, especially as regards the prevention

of sepsis. Sherman[5] thinks Lane's **Plates** are the best, and should be used if it is found that reasonably accurate approximation cannot be secured by splints, extension, and other mechanical appliances. In the majority of compound fractures, it will be found necessary to remove the plates and screws. He says the vanadium steel plates are better than those of high carbon steel, and recommends a self-tapping machine screw in place of the wood screws hitherto used.

Bartlett and Hewitt[6] made some experiments in dogs as to the force required to dislodge screws placed in the pipe bones of dogs. The screws were drawn out with a direct pull, no leverage being used, and if no infection took place great force was necessary to dislodge them. They have operated on fifty-two patients with a mortality of 3·84 per cent; but in this connection it must be remembered that the cases were picked as being too difficult for ordinary treatment, and often occurred in patients with poor physique. They consider Lane's plating the best form of treatment for non-union or mal-union of fractures. It is also indicated in all fractures which cannot be readily kept in place. It cannot, however, be recommended as a harmless procedure in the hands of surgeons generally. It is something of a speciality, and requires its own extensive armamentarium; at the same time, it will tax the mechanical resourcefulness of the best operator. It is advisable to wait a few days before operating, until the initial shock is past, the bleeding ceased, and a wall of granulation tissue partially protects from infection.

Bartlett[7] gives the results of plating bones in dogs and then allowing them to run about without any external splinting. The results were good. He has also used Lane's plates in suppurating fractures in human beings.

Lund[8] has operated on several cases of non-union of fractures, and of badly united fractures. He has found these operations difficult to perform, tedious, and sometimes unsuccessful. He has used Lane's plates except near a joint or an epiphysis; where one of the fragments has been small, he has used a staple. In eleven cases he has had only one of infection. Here the plates had to be removed on the tenth day, but union in very good position was secured. He thinks with care it will rarely be necessary to remove plates applied to bones which, like the humerus and femur, lie deeply covered by muscles; but it is more difficult to get plates to heal in when they are covered only by skin, e.g., in the tibia. In bad oblique fractures of the shaft of bones, where reduction is not satisfactory, the operation is of benefit. **Iodine Preparation of the Skin** is satisfactory.

Freeman[9] suggests the use of external **Clamps** in the treatment of oblique fractures in bones. He uses two screws, placed if possible away from the damaged bone and tissues; the fracture is reduced and the screws held in position by steel clamps. He believes if the operation is a clean one, serious infection will not occur.

Darrach[10] states that in the Roosevelt Hospital, New York, 2,100 fractures have been treated during the last two years, and of these

104 were operated on: this, he thinks, indicates the proportion of suitable cases, viz., 5 per cent. Out of 107 cases, fifty-seven were recent. If a satisfactory reduction cannot be both obtained and maintained by the closed method, the fracture or dislocation should be operated on, there being no further contraindication.

He says that unless a man is able and willing to educate himself by laboratory practice, and to follow out the extreme and exaggerated technique of Mr. Lane, he has no right to operate on fractures; this applies to assistants as well as to operator. After obtaining reduction, as simple and as little foreign material should be left in the wound as need be—plates and wire only when they are really required. Of fifty-seven recent fractures reduced by the open method, no appliance was used in twenty-two, simple suture in seventeen, wire in two, and plates in sixteen, with one aluminium dowel. The after-splinting must be as careful as if it were a closed reduction; the splint should be applied with the limb in such a position that there is no strain on the plate, for it is the slight continual pull that loosens the screws. In late cases the open reduction is most difficult. In the 107 cases there were three infections, none of which was serious. He uses aluminium and steel plates, and thinks the vanadium steel plates the best. [It seems to the editor that duralumin might be useful for making plates.—P. L.]

Sampson[11] gives the results of Arbuthnot Lane's operations for fractures in children in the Great Ormond Street Hospital. Since 1907, 104 cases of fracture have been treated in the hospital, and seventy-two of these have been submitted to open operation. In *x*-ray pictures of fractures, two views should be taken in planes at right angles to each other. In children, the transparency of the epiphyses introduces a special difficulty into the correct interpretation of radiograms; in such cases it is essential to have corresponding views of the sound limb.

Operation is *contraindicated* when there is no displacement, as in subperiosteal and greenstick fractures, and when the affected portion of the bone has little functional importance, e.g., the upper end of the fibula. Compound fractures must also be regarded as a contraindication in the routine operative treatment. In these cases asepsis is no longer under the control of the surgeon, and the insertion of a foreign body will always be a risky procedure. Unhealthy conditions of the skin in the region of the proposed incision, whether due to abrasions sustained at the time of the injury or to pre-existing inflammation, preclude operative interference. Children under two years of age, when suffering from severe rickets, are unsuitable for operative treatment.

The operation is performed as soon as possible after admission. Twenty-four hours before operation the limb is cleansed with soap and water, and six hours later is painted with tincture of iodine; the iodine is again applied in the theatre. A sufficiently long incision is of paramount importance, e.g., in fracture of the shaft of the femur

an incision is made along the outer side of the thigh from the lower border of the great trochanter to within a short distance of the external condyle. The most difficult part is the approximation of the fragments, and infinite pains and patience are often requisite before this object is satisfactorily attained. Sometimes the plates have to be removed and re-applied several times. No tourniquet is needed. Michel's clips are used for the skin. Some form of light apparatus is employed to preserve the alignment. The clips are removed on the tenth day and the limb put up in plaster.

The ages of seventy-two patients varied from one month to twelve years. There was no case of wound infection. Rarefying osteitis, and the so-called "aseptic sinuses," have not been encountered. The mortality was nil. In sixty cases metal plates were used, and two were subsequently removed. The large majority of the cases were fractures of the femur. Some fractures always give bad results with conservative treatment; in children, we may instance fractures of the long bones of the lower limb, fractures of the forearm, and those implicating the elbow and other important joints. These call for operative treatment. The main factor in the operation is *absolute asepsis*. The results are not so good in mal-united or ununited fractures, and Sampson says operative treatment should be applied to recent fractures and not reserved for the imperfect results of conservative measures.

Arbuthnot Lane[12] records two cases of very bad ununited fractures treated by his methods with excellent results. He again lays stress on the observance of strict asepsis, and says surgeons are learning by painful experience that they cannot fix fragments in fractures by foreign bodies with the casual attention to asepsis found sufficient for abdominal and other operations.

Babler[13] gives the end results of sixty-six cases of plating in fractures of the long bones. Shortly after Lane's monograph first appeared, he saw disaster follow plating in the hands of some of the best surgeons, and was reluctant to recommend this form of treatment except in compound fractures or cases of non-union. During the last two years he has used the method in several cases, and has attempted to trace each. To thirteen cases of simple fracture of the femur, sixteen plates were applied; there was one death from shock following a second plating, and one from sepsis. Out of twelve simple fractures of the tibia, six became infected; six also out of nine compound fractures. One patient died from amputation following sepsis. Nineteen out of twenty-one patients with fracture of the tibia had to have the plates removed, and nine other plates were removed from superficial bones, e.g., clavicle, radius, ulna, and fibula. In sixty cases in which there were sixty-six platings, there was one operative death, one from post-operative pneumonia, and two from sepsis. There were twenty-six perfect results. His conclusions are that plating yields the best results in cases of non-union, of compound fracture with considerable displacement, and of simple fracture

of the humerus and femur in which the skiagraph indicates the inefficiency of the closed treatment. Plates should never be placed immediately below the skin unless their removal is anticipated. Babler seldom, if ever, plates the clavicle, radius, ulna, or fibula, since the absorbable wire is preferable. Morris[14] recommends the use of **Dowel Pins** in fractures, introduced with a cannula through a small incision in the skin.

Fractures near Joints.—Cotton[15] says that the difficulty lies in reduction rather than in retaining the position when reduced. If an operation is done, a plate is rarely required ; in most cases chromic gut or wire, or rarely a pin of steel, or a staple, is enough. In joint fracture what concerns us most is the restoration of the joint as a mechanical unit. Operative reposition is necessary in only a small percentage of cases. The common cause of lost motion is failure to mobilize early, to avoid the stiffening of the non-bony parts. Adhesions within joints and in tendon sheaths are rare relatively, but capsule thickening and retraction, with or without bony overgrowth, are common, and muscle shortening due to disuse is universal. Surgeons are apt to forget that fixation of a joint in traumatic cases (save in young children) is a potent cause of loss of articular movement. In joint fractures in adults, imperfect results are largely due to stiffening, which in turn depends on muscle shortening and on scar formation in stripped-up periosteum and the capsule itself. These are not amenable to operation, and are best avoided by early massage and active or " active assisted " (not passive) motion.

In certain joints (patella and hip), non-union is a bugbear. Cotton's opinion is that though this may be in part due to lack of nutrition and fixation, another very important factor is the presence of synovial fluid. Its presence prevents or checks clotting of blood, and thus hinders callus formation. To ensure union in joint fractures, we must exclude the synovial fluid, and ensure callus by securing contact. The impacted hip fracture unites, and if the fragments of a loose broken hip be artificially impacted or driven together by the forgotten technique of Senn or by Whitman's abduction method, they unite because contact is secured.

Wrist.—The commonest injury is Colles's fracture. Here operative treatment is absolutely limited to the late correction of bad results. Much can be done by osteotomy ; if the Thomas' wrench will not reduce, open operation is inevitable. No plates or sutures are required ; splints are sufficient once reduction is accomplished. In *separation of the radial epiphyses*, perfect apposition is necessary, and when he could not reduce in early cases, Cotton has operated ; with an open wound, reduction by leverage is easy, and the epiphyseal cap is kept in place by ordinary splints. The wrist injuries that most often call for incision are *fracture-luxations of the carpus*, of which the scaphoid fracture is commonest. If accurate reduction is possible, good results may be obtained ; if not, operation is necessary, including excision of the fractured bone as a rule. In the medio-carpal luxation

with scaphoid fracture, not only the scaphoid fragments but the semilunar and part of the os magnum and cuneiform must often be removed.

Elbow.—In fractures of the *olecranon*, operation must practically always be undertaken ; wire or tendon sutures must be passed through the bone. In fractures of the *head of the radius*, operation is often called for ; the rule is to wait for a month, and then if necessary to excise the head ; the result is usually satisfactory. Fractures of the *humerus* at the elbow occur chiefly in children ; under skilful reduction and proper treatment these do well. This treatment may fail through unreduced backward displacement limiting flexion by contact of the coronoid process with the end of the shaft ; through rotation of the shaft throwing a spur in the way of the coronoid in flexion ; or through " gun stock " deformity from lateral deviation of the lower fragment carrying with it the bones of the forearm. In the first two classes, the bony spur that is in the way must be excised through an incision on the outer side of the joint. " Gun stock " deformity can be cured only by supracondylar osteotomy, with subsequent correction, and retention at first on a straight, then on a right-angled splint. The results are uniformly excellent.

The other common fracture is *separation of the epiphysis of the external condyle.* If this epiphysis can be replaced, it can be held firm by the acute flexion treatment. The fragment often rotates ; in this case open reduction, with fixation by a pin driven through the skin and fragment into the humerus, gives excellent results. The pin comes out in about two weeks. Fractures of the *internal epicondyle* do well in acute flexion, and call for operation only when the ulnar nerve is involved. The nerve once freed, the epicondyle may either be removed or sutured in place. In adults, fractures of the humerus at the elbow show poorer results. The treatment is about the same as in children. There are occasional T-fractures in adults with wide separation of the condylar fragments that call for a wiring or nailing of the fragments in position. Kocher's " fractura rotuli humeri," in which the articular face of the external condyle is split off and lies loose in the joint, is rare ; the fragment should be removed. Unrecognized *dislocations at the elbow* seen late, either in children or adults, furnish the most difficult of the elbow operations. The joint must be pretty well taken apart and reshaped ; the results are good, though rarely perfect, failure being due to inadequate operation.

Injuries of the Shoulder.—Fractures of the *anatomical neck*, if loose, are hard to reduce, but the results of even imperfect reduction compare very favourably with those following operation. Impacted fractures must be left alone. In fractures of the *surgical neck*, a proper reduction is often impossible without incision. The proper course is to cut down, to reduce by prizing leverage, and to suture or staple the fragments together. It is usually easy to hold them because of the ragged interlocking fracture surfaces. *Separation of the epiphysis* corresponds almost exactly to the above fracture ; operative reposition is in most

cases needed, as accuracy is very important. *Fracture of the greater tuberosity* does well without operation. *Dislocations of the shoulder*, not otherwise reducible, should always be operated on. *Fracture-dislocations* are not reducible except by operative means. As a rule these cases are seen too late, and the results of operation are rather disappointing as to motion and power. If seen late, excision of the head is usually called for.

Hip Fractures.—Impacted fractures should only be operated on when extreme outward rotation occurs, and then only in young vigorous patients. In such cases we may break up and re-impact with the mallet or by forced abduction. In *unimpacted* fractures, repair without operation should be attempted ; if repair does not occur, operation may be practised if the patient can stand it. The best avenue of approach is from the front ; Cotton has always managed to approximate by traction and abduction without the use of pegs. Fractures through the trochanters repair well, though with clumsy callus. Fractures below the trochanter call for operation when the upper fragment is so pulled up by the ilio-psoas that it cannot be reduced and held effectively. In such cases a plate is needed. Cotton has preferred the slightly elastic Sick or Mayo plate.

Injuries about the Knee.—If reduction and retention do not succeed, operation must be done. Here, as with other lesions at the line of growth, it is important to avoid unnecessary fixation (e.g., plates), and a suture well placed, or at worst a temporary pin, will suffice. In fractures of the *patella*, the tendon rather than the bone should be sutured if possible.

Ankle.—There are a few fractures close above the ankle—fractures of both bones—in which we must both operate and plate. In fractures involving the joint, there seems to be no excuse for plates of any kind, and in the fresh fractures no reason for any operation, save in one form of lesion, viz., the *fracture by inversion* (reversed Pott's), in which the large fragment of the internal malleolus is hard to hold, and tends toward non-union.

Impacted Fractures of the Femoral Neck.—Zachary Cope[16] says the recent facts demonstrated by the Röntgen rays have not yet obtained due prominence in the current text-books on general surgery. Most impacted fractures are due to direct violence ; in indirect violence it is rare to get impaction primarily, though this may result from the fall upon the trochanter which frequently follows. The usual cause of an impacted fracture is a fall whereby the hip strikes the ground, more rarely by some heavy object falling on the hip. The precise lesion depends on the age of the patient and the direction of the injuring force. Up to the age of twenty it is not unusual for the epiphyseal attachment to give way, and a traumatic coxa vara to result, though fracture may occur at this age. In middle age and later life, an impacted fracture of the neck or trochanter region results.

Impacted fracture may occur (1) Through the neck of the femur, wholly within the capsule ; or (2) Through the base of the femoral

neck, or in the trochanter region. By an "impacted fracture" is meant one in which the fragments are not movable on one another immediately after the accident. Cope says it is comparatively common to find an impacted fracture of the femoral neck wholly within the capsule, resulting from violence directly applied over the great trochanter.

1. There are two sub-groups in this class: (i) The type described as "extracapsular"—fractures with shortening, eversion, and loss of power in the limb; and (ii) Atypical cases, with deformity varying according to the direction of impaction. Slight shortening and various degrees of flexion, adduction, and inversion result. There are three reasons why an error of diagnosis may occur in this fracture. First, the shortening is slight (differences of half an inch or less in shortening are difficult to detect); next, the impaction may produce an attitude of the limb not usually associated with fracture (in one case the position assumed by the limb resembled that due to dorsal dislocation of the hip); and last, the loss of function at the hip may not be complete. It is quite possible that some cases of fracture through the neck, caused by indirect violence (i.e., the common fracture in old people), may become tightly impacted because of an immediate second fall upon the trochanter of the affected side. In most of the cases seen by Cope, this causation was negatived by the nature of the accident.

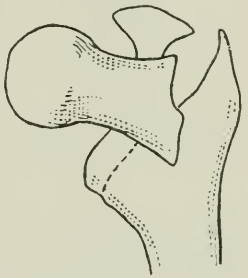


Fig. 54.—Showing lines of separation in common type of fracture through base of neck.

2. This class includes all those which used to be loosely called "extracapsular fracture of the neck," a terminology anatomically incorrect and clinically of doubtful value. From outward appearance it is often difficult or impossible to tell whether this fracture or an impacted fracture near the head has happened. Both occur in middle or old age and result from the same kind of violence. Perhaps greater force is responsible for fracture through the base of the neck, as shortening and eversion of the limb, and bruising over the trochanter are more marked in these cases. The mechanism of the two fractures is quite different: in fracture through the neck, the firm tissue of the lower part of the neck is tightly impacted into the cancellous tissue of the upper part of the head; in fracture through the base of the neck, the cancellous tissue of the great trochanter is split up by a firm wedge of bony tissue belonging to the cervix femoris. This wedging of the cervix into the trochanteric region is responsible for two or three secondary fractures which

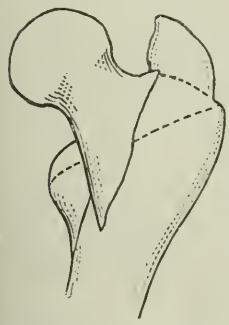


Fig. 55.—Showing lines of primary and secondary fracture in second type.

frequently complicate the primary breakage. One secondary fracture is due to vertical splitting of the great trochanter (*Fig.* 54), and usually separates off the posterior part of the great trochanter and the adjoining bone, including the lesser trochanter and even a little of the shaft beyond; another is horizontal, and separates the top of the great trochanter from the previously detached fragment (*Fig.* 55). Occasionally, and probably from a greater degree of violence, the lesser trochanter and a flake of adjacent bone from the shaft are split off owing to the cutting action of the lower compact tissue of the neck (*Fig.* 56). Ralph Thomson has pointed out that the calcar femorale probably plays an important part in the causation of these secondary fractures. The calcar is a vertical plate of bone standing upright in the midst of the cancellous tissues of the femoral neck; the base is attached to the inner and under surfaces of the neck as far down as the lesser trochanter, and its outer edge points like a vertical razor edge towards the great trochanter.

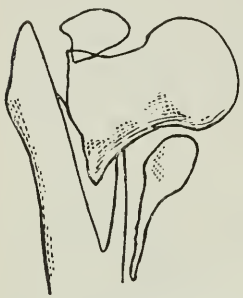


Fig. 56.—Showing the third type of fracture through base of neck.

References.—[1]*Ann. Surg.* 1912, i, 338; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1351; [3]*Ann. Surg.* 1912, ii, 162; [4]*Jour. Amer. Med. Assoc.* 1911, ii, 1353; [5]*Ibid.* 1912, i, 1557; [6]*Ibid.* 1911, ii, 1347; [7]*Ibid.* 1912, ii, 346; [8]*Boston Med. and Surg. Jour.* 1911, ii, 827; [9]*Ann. Surg.* 1911, ii, 381; [10]*Jour. Amer. Med. Assoc.* 1912, ii, 350; [11]*Lancet*, 1912, ii, 433; [12]*Ibid.* 1911, ii, 1255; [13]*Jour. Amer. Med. Assoc.* 1912, i, 158; [14]*Ibid.* 1911, ii, 1345; [15]*Ibid.* 1912, ii, 190; [16]*Ann. Surg.* 1911, ii, 682.

FURUNCULOSIS. (*See also* Boils, *and* Skin Diseases, General Therapeutics.) *E. Graham Little, M.D., F.R.C.P.*

McDonald[1] reports some striking personal successes in treating furunculosis in young children with stock staphylococcus **Vaccines.** The nature of the infection having been ascertained, doses of from 25 to 150 millions were given at intervals of seven days. All existing boils must be opened and treated surgically as well.

Cropper[2] recommends the removal by **Excision** of the central area of the boil as soon as inflammation is established. The part treated must be frozen with ethyl chloride, and the whole centre cut away with a sharp cataract knife, and the wound dressed antiseptically. Pain and subsequent scarring are partly mitigated by this method, and infection of the neighbouring skin is prevented.

References.—[1]*Arch. Pædiatr.* 1911, 772; [2]*Brit. Med. Jour.* 1912, i, 361.

GALL BLADDER, SURGERY OF. (*See* Biliary Tract.)

GALL-STONES. *Robert Hutchison, M.D., F.R.C.P.*

Berg[1] reports favourably on the effects of **Chologen.** It acts by increasing the solvent power of the bile for cholesterin, and possesses also a disinfectant and cholagogue action. It is specially useful as

a prophylactic against gall-stone formation and in the treatment of the initial stages of the disease. It lessens inflammatory changes in the bile passages and favours the passage of small stones into the intestine. In the case of larger stones a condition of "latency" may be brought about. Chologen is given for three months at a time, twice a year.

REFERENCE.—[1]*Deut. med. Woch.* 1911, 2375.

GANGRENE. (*See* ARTERIES, SURGERY OF.)

GASTRIC CONTENTS, EXAMINATION OF. *Oskar C. Gruner, M.D.*

Tryptophan Test.—The diagnosis of cases of *cancer of the pylorus*, where the tumour is obscured by its anatomical position, is much aided by the glycyltryptophan reaction, but not so much as by *x*-rays. When both the *x*-rays and the tryptophan reaction point to a tumour, it must be far advanced. A negative tryptophan reaction does not exclude cancer, even if the reaction is negative on several occasions.

Kayser[1] thinks that the reaction is hampered by much retention of gastric contents. Therefore it is wise to empty the stomach before giving the test breakfast, and the subsequent contents must be tested for bile pigment and blood before applying the tryptophan reaction, because blood and bile alone will give the reaction. Weinstein[2] claims that this test enabled a correct diagnosis to be made in a series of cases of pyloric obstruction. However, he admits that there are certain failures. It is inconstant in its appearance; that is to say, it is not always present in the contents of any given cancer patient. Regurgitated intestinal food is an important source of error; if duodenal contents pass back into the stomach, they will give the reaction. This test may be applied even though the gastric juice contains free hydrochloric acid.

The best meal to give with the test is a glass of sweetened water, with some white bread, or toast and biscuits. Milk may also be added, but not tea, coffee, or other colouring food.

The gastric contents are removed in an hour, filtered at once, and tested directly for tryptophan. If this test fails, keep the contents in a thermostat for twenty-four hours, and then test for tryptophan again. Use filtered stomach contents; acidify with acetic acid, if desired. Take 6–7 c.c. in a test tube, add a few drops of 3 per cent acetic acid, and add saturated aqueous bromine, drop by drop, from a pipette. A reddish-violet or rose-red colour signifies tryptophan. Allow fifteen minutes for the colour to appear. Excess of bromine would spoil the reaction by causing a precipitate. The test has been modified by Frank Smithies[3] in order to economize. His paper should be consulted for details.

Albumin Content.—Successive dilutions of the filtered gastric contents after the test meal are placed in test-tubes: 1–10, ·5–10, ·25–10, ·1–10, ·05–10, ·025–10, using distilled water as a diluent.

To each is added 1 c.c. of the following reagent, as if for a ring test.

℞	Phosphotungstic acid	0·3	Alcohol (96 per cent)	20
	HCl pur.	1·0	Aq. dest.	200

The lowest dilution in which a ring will appear gives the amount of albumin. The albumin value may be 10, 20, 40, 100, 200, and 400 respectively. If the albumin-content is below 60, it means absence of carcinoma; if over 200–400, it means carcinoma. One hundred means a border-line case (Thiele[4]).

Eosinophilia.—Film preparations of gastric contents may be stained with Leishman and studied in order to ascertain whether eosinophiles are present in number or not. In the former case, the probabilities are in favour of malignant disease, although Moacanin[5] found eosinophilia in a case of achylia gastrica.

References.—[1]*Deut. med. Woch.* 1912, 551; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1420; [3]*Ibid.* 1912, i, 1008; [4]*Berl. klin. Woch.* 1912, 544; [5]*Wien. klin. Woch.* 1911, 1335.

GASTRIC DISORDERS. (*See* Stomach, Diseases of; Stomach and Duodenum, Ulcer of; and Stomach, Malignant Diseases of.)

GASTRIC ULCER. (*See* Stomach and Duodenum, Ulcer of; and Vomiting, Anæmic.)

GASTRITIS.

(*Vol.* 1912, *p.* 36)—According to Italian writers ,cases of gastric disturbance with much mucus in the vomit are benefited by internal administration of **Protargol** carried out by means of lavage.

GENU VALGUM.

(*Vol.* 1912, *p.* 260)—By the use of an appropriate **Splint** (an illustration of which is given at the place referred to) and **Elastic Traction** a cure can be effected in mild grades of this deformity.

GLAUCOMA. *A. Hugh Thompson, M.D.*

Failures after iridectomy for chronic glaucoma are so frequent that the tendency among ophthalmic surgeons at present is to adopt in its place one of the newer operations which aim at the formation of a permanently permeable cicatrix. In order that this subject should be understood, it will be well to recapitulate a few fundamental facts.

Etiology.—The essential condition of glaucoma is an unduly high degree of tension of the intra-ocular fluid. This condition is associated with a relative stasis in the circulation of this fluid, whose main channel of exit under normal conditions is Schlemm's canal, a sinus situated at the junction of the cornea and sclerotic, forming a complete ring round the anterior chamber, from the angle of which it is only separated by loose tissue known as the " pectinate " or " cribriform " ligament.

So far all authorities are agreed. As to the causes of the difficulty in the circulation of the intra-ocular fluid, the views of one writer—Thomson Henderson—are peculiar, but as they have been referred to

at some length in the MEDICAL ANNUAL, 1909 and 1911, it is unnecessary to say more about them here. Nearly all ophthalmologists are agreed that the immediate cause in the great majority of cases is the partial or complete obliteration of the angle of the anterior chamber through which, under normal conditions, the fluid finds an exit from the globe.

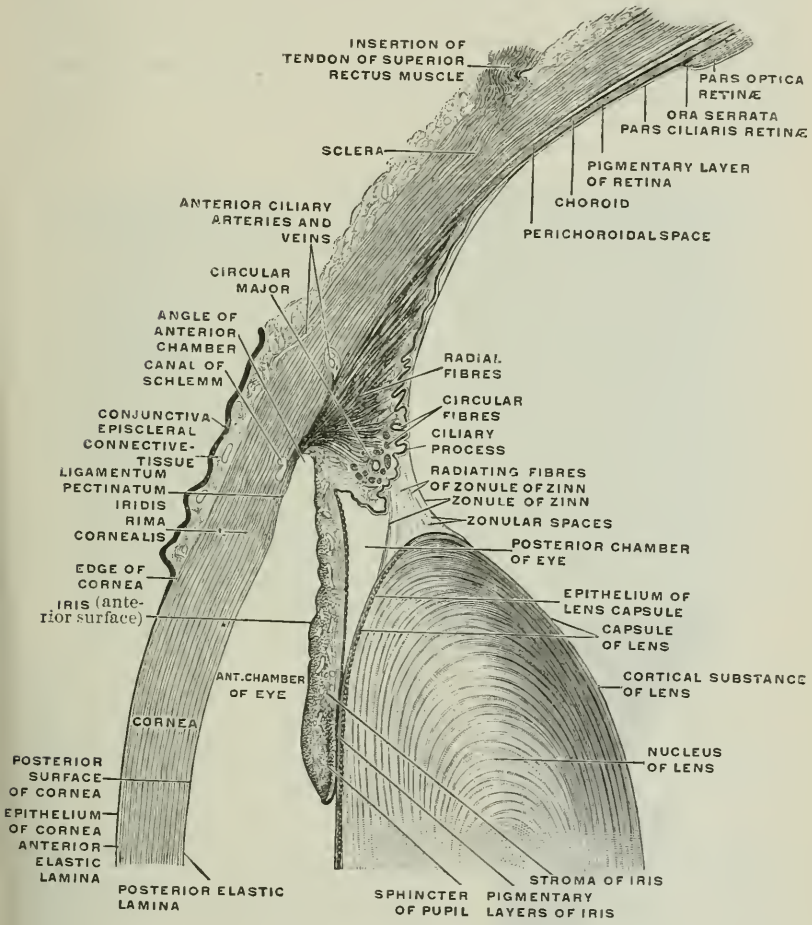


Fig. 57.—Sagittal section through front of eyeball (upper half).—*(From Weeks' "Diseases of the Eye." By permission.)*

How is this brought about? In some cases of secondary glaucoma the obstruction is farther back than the angle, the whole of the anterior chamber being obliterated. This may happen in "iris bombé" where, owing to past iritis, the aqueous is confined in a completely closed chamber behind the iris. It may also happen in the case of a

lens dislocated into the anterior chamber. Where, as in most cases, the obstruction is at the angle itself, the cause may lie in the albuminous nature of the fluid, which is unable to pass through the filter constituted by the pectinate ligament. This happens in cyclitis associated with what is generally called " keratitis punctata." In the great majority of cases of glaucoma, however, the angle of the chamber is so shallow as to be practically obliterated. This may be so although the chamber appear on inspection to be of normal depth ; that the obliteration is a fact is proved by Priestley Smith's[1] examination of fifty-four eyes lost by primary glaucoma. In forty-nine of these he found the iris base applied and more or less adherent to the cribriform ligament ; in five only was the angle open.

If we go back a stage farther in the chain of causation, we find (according to Priestley Smith and the generally received doctrine) that the cause of the iris base being displaced forward is pressure from behind, i.e., the pressure either of a distended ciliary body or of an unusually large lens transmitted through the ciliary body. In acute glaucoma it is the ciliary body itself which is distended with blood. In chronic glaucoma it is generally the lens which, even if not unusually large, is yet so in comparison with an unusually small globe. The horizontal diameter of the cornea is normally about 12 mm. " In a certain number it will be found to be abnormally small, viz., 10·5 mm., or less. Among 112 consecutive glaucoma patients measured some years ago, I found it so in 22 per cent, whereas among 500 unaffected persons it was so in less than 2 per cent " (Priestley Smith[2]).

A recent contribution to the theory of glaucoma has been made by Prof. Arthur Thomson[3] (who has kindly allowed us to reproduce his

Fig. 58.—To show how by the backward displacement of the scleral process induced by the action of the ciliary muscle, the lumen of Schlemm's canal is enlarged.

The solid lines represent the parts when the muscle is inactive. Under these conditions, for the sake of clearness, the canal of Schlemm is represented as open, though much narrower than when the ciliary muscle is contracted as indicated by the dotted lines.

(*a*) Schlemm's canal. (*b*) The iridial angle when the ciliary muscle is relaxed and the scleral process is drawn forward by the elasticity of the pectinate ligament. (*c*) The scleral process or spur with the pectinate ligament attached in front and the ciliary muscle behind.

diagrams) from the purely anatomical standpoint. Starting from the acknowledged fact that the efficient drainage of the anterior chamber normally depends on the ready access of its fluid to Schlemm's canal,

he shows that this largely rests upon a suction action caused by the intermittent action of the radial fibres of the ciliary muscle on the one hand, and the contractor of the pupil on the other. *Fig.* 58 explains this. The muscle fibres, it will be seen, are attached to a spur of scleral tissue which is movable, and when they contract, cause the cleft known as Schlemm's canal, which is usually empty, to dilate. The enlarged view (*Fig.* 59) will make this more clear, and the succeeding diagrams (*Fig.* 60) will explain how the muscle opens not only the canal of Schlemm itself, but also the channels that lead into it from the aqueous. The circular fibres of the ciliary muscle, and the sphincter muscle of the iris, assist in pulling the spur inwards and backwards.

Fig. 59.—Enlarged View of the Iridial Angle.

(*a*) Canal of Schlemm. (*b*) Trabecular tissue of pectinate ligament. (*c*) Scleral vein. (*d*) Dense scleral tissue. (*e*) Scleral process or spur projecting inwards and forwards from the sclera close behind the canal of Schlemm. (*f*) Radial muscular fibres of the iris extending outwards below the iridial angle. (*g*) Iridial angle. (*h*) Meridional fibres of the ciliary muscle. (*i*) Circular fibres of the ciliary muscle.

Consequently "the fibres of the pectinate ligament, which are attached to the anterior surface of the scleral spur, are put on the stretch." This means that Schlemm's canal is converted from a mere slit into a channel within whose lumen a negative pressure is maintained by the action of the muscles. When they are relaxed the elasticity of the pectinate ligament causes it to become a slit again, the contained fluid finding an exit through minute channels which communicate with the surrounding veins.

According to these views, then, the efficient drainage of the anterior chamber requires an intermittent contraction of the ciliary muscle. Its constant and prolonged contraction, on the other hand, as in

uncorrected hypermetropia, by tending to keep Schlemm's canal permanently dilated, would militate against efficient drainage. Another way in which the same result would follow would be through impairment of the elasticity of the pectinate ligament.

Treatment.—Enthusiastic advocates of the newer methods to be spoken of presently, claim that they should supplant iridectomy not only in the treatment of chronic but also of acute glaucoma. But the experience of most with regard to acute cases is that iridectomy is a thoroughly satisfactory operation if only its performance is not postponed until too late.

The same cannot be said of chronic glaucoma. The reason is plain. In acute cases the duration of the disease is a matter of days, and the

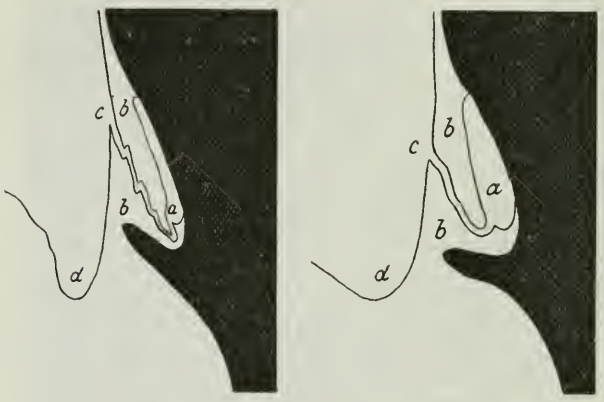


Fig. 60.—To illustrate how the channels in the pectinate ligament are kinked and compressed when the scleral process is drawn forward, and how they are opened and straightened when the scleral process is pulled back, thus imparting to them a valvular action. (*A*) Illustrates the conditions when the scleral process is pulled forward by the elasticity of the pectinate ligament. (*B*) When the scleral process is pulled back by the action of the ciliary muscles.

(*a*) Canal of Schlemm. (*b b*) The trabecular tissue of the pectinate ligament with (*c*) A lymph channel running irregularly through it; (*d* in *A*) The iridial angle when the scleral process is pulled forward and the pupil dilated; (*d* in *B*) When the scleral process is pulled back and the pupil contracted.

obliteration of the angle of the anterior chamber is a merely mechanical phenomenon. As soon as the congestion of the ciliary body is relieved by leeches, purgatives, etc., the removal of a fairly large piece of the periphery of the iris is sufficient to re-establish the circulation of the intra-ocular fluid. In chronic glaucoma, on the other hand, the conditions causing it have been in action for months or even years; the base of the iris is not only in contact with the cribriform ligament, it is organically united with it in most cases. Hence the failure of iridectomy to re-establish the circulation, and the necessity of establishing some alternative route through which the fluid in the aqueous chamber may find an exit. A channel leading direct from the aqueous

chamber to the subconjunctival space, would form such an alternative route, and all modern efforts to devise a satisfactory operation are directed towards providing a permanent channel of this kind. The earliest operation for this purpose is that of simple **Sclerotomy.** It is still practised, and it has been observed that in successful cases there is evidence of the permeability of the scar in a localized œdema of the conjunctiva. Some writers maintain that the same holds good with successful cases of iridectomy, which operation, they say, does not cure by freeing the angle of the anterior chamber but by providing a permeable scar. It is, however, acknowledged on all hands that to obtain this result by either of these methods is at the best very uncertain. To devise a method which shall ensure it as a constant result is the object of nearly all the newer operations. Of these, Lagrange's **Sclerectomy** was described and figured in the MEDICAL ANNUAL, 1907 and 1908. Heine's **Cyclo-Dialysis** (MEDICAL ANNUAL, 1910) only aimed at providing a permeable channel as far as the supra-choroidal space, and is now practically abandoned.

Herbert's **"Wedge" Operation** (MEDICAL ANNUAL, 1909), and his more recent **Flap Operation** (MEDICAL ANNUAL, 1911 and 1912), were devised with the same object, and the latter is largely practised in this country. In the opinion of the present writer, the modification of the latter by the use of Harman's scissors (MEDICAL ANNUAL, 1912) renders it quite easy to perform, and it is an effective procedure.

Of all the newer operations, however, that which at the present moment probably enjoys most popularity is **Trephining the Sclera.** Fergus applies the trephine at some distance from the sclero-corneal limbus, and after completing the trephining as far as the subchoroidal space, creates a channel into the aqueous by means of a cyclo-dialysis. Elliot,[4] on the other hand, applies the trephine as close as possible to the corneal margin, so as to effect a direct entrance into the anterior chamber. A clear account of his operation, as practised in London, is contributed by B. T. Lang,[5] who has also kindly lent the accompanying illustrations.

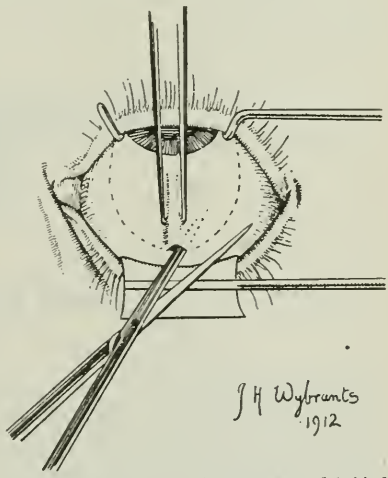


Fig. 61.—Right eye from above and behind, as seen by the surgeon during the first stage of the operation.

Since the object of the operation is to effect a communication with the anterior chamber, it is essential that the trephine hole be made as near as possible to the cornea. Since the limbus extends farther on to the cornea above and below than at the sides, it is easier to make the hole either above or

below. The first stage is to make a conjunctival flap. There is a certain risk of buttonholing the flap, and therefore there is an advantage in making this large (*Fig.* 61). The flap must be reflected right up to the corneal margin, and in order to make sure of getting into the anterior chamber it is advisable to continue it for about a milli-

Fig. 62.—Desmarres' secondary cataract knife.

metre into the cornea, which is best done by splitting the edge of the cornea into two layers with a sharp knife (*Fig.* 62).

The sclera being now exposed, the next stage is to apply the trephine, which should have a cutting edge of 1·5 or 2 mm. in diameter

Fig. 63.—B. T. Lang's corneal trephine.

(*Fig.* 63). It should be applied as far forward as possible and turned to and fro, with the gentlest pressure, taking care to keep the axis of the trephine all the time perpendicular to the area of contact. Nimmo Walker[6] (Liverpool) recommends the use of a mechanical

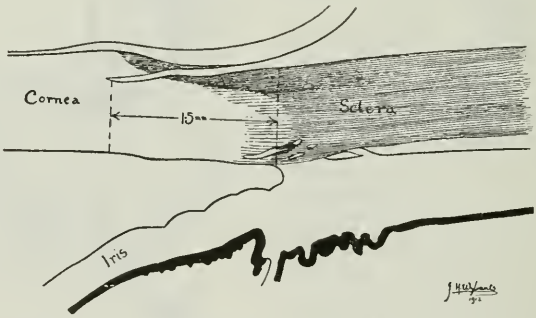


Fig. 64.—Drawn from a section of a normal eye. The eye was excised during an operation for sarcoma of the upper jaw and orbit. It was fixed in 5 per cent formalin in normal saline. A corneo-conjunctival flap was reflected from above as described in this paper. Portions of the eye were cut away on a freezing microtome until the section passed vertically through the centre of the cornea. With the aid of a small amount of gum, a slide was frozen on to the cut surface. The eye was now thawed off the microtome, and the slide with the eye still frozen to it was reversed, placed on the microtome, and with the aid of a little gum, frozen on to it. The eye was then cut away once more until a very thin layer was left. A cover-slip was laid on and the whole was allowed to thaw. This procedure was adopted to avoid any of the shrinkage effects associated with the usual methods of embedding tissues for section. This particular section varied in thickness in different parts, from 12 to 28 μ. The drawing was made from the section. The dotted lines show the amount of the corneo-sclera removed by a 1·5 mm. trephine. It will be seen that the splitting of the cornea enables one to make the trephine hole so far forward that it is impossible for it ever to become blocked by iris or iridic exudate. Should be compared with *Fig.* 65.

trephine. Some practice is needed to know exactly when the corneo-sclera has been cut through. Beginners will do well to err on the side of caution, as the trephine can easily be removed and reapplied as often as necessary. When through, the disc is removed with forceps (scissors may be used to complete the removal). An iris repositor is passed through the hole into the anterior chamber. If the iris is inclined

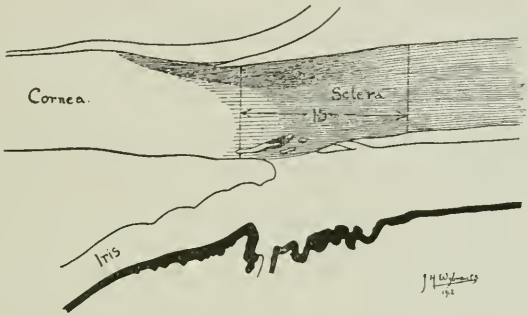


Fig. 65.—A diagram made from *Fig.* 64 to show where the trephine hole would come if the flap is insufficiently reflected. Eyes that have been operated upon in this manner are relieved for a time, but later the tension again rises. In such eyes a bridge of white tissue of the limbus or sclera is seen to intervene between the trephine hole and the cornea.

to bulge into the wound, a small peripheral iridectomy should be performed. Otherwise, and if the pupil retains its proper shape, this is not necessary. *Figs.* 64 and 65 demonstrate the importance of making the trephine hole sufficiently far forwards.

References.—[1]*Ophth. Rev.* 1912, 68; [2]*Ibid.* 293; and 1910, Oct., to 1912, Oct.; [3]*Ophthalmoscope*, 1911, 470; [4]*Ibid.* 567; [5]*Lancet*, 1912, i, 987; [6]*Liverp. Med.-Chir. Jour.* 1911, 406.

GLEET.

(*Vol.* 1912, *p.* 96)—May sometimes be cured by **Zinc Ionization** applied by means of a suitable bougie in moderate doses. (See also Gonorrhœa.)

GLOSSITIS, CHRONIC. (*See* Syphilis, *and* Tongue, Atrophy of.)

GLYCOSURIA. (*See also* Diabetes, *and* Urine Tests.)

Francis D. Boyd, M.D.

Garrod,[1] in the Lettsomian Lectures, points out that it has been long recognized that cases of diabetes differ very widely in their course and outlook, and evidence is accumulating that diabetes is no definite circumscribed disease; that the disturbance of carbohydrate metabolism which leads to the accumulation of sugar in the blood and so to glycosuria, has its origin in a variety of causes.

There is no urinary anomaly of which we should know more than of glycosuria, for thousands of specimens of urine are tested every day for sugar; but many of the recorded observations are vitiated by the absence of conclusive evidence that the abnormal substance

excreted in the urine is really glucose. An orange precipitate obtained with Fehling's solution on boiling is sometimes due to the presence of a combined glycuronate. *Glycuronic acid* is closely allied to the sugars, but the error which its presence indicates lies, not so much in the carbohydrate metabolism, as in one of the protective mechanisms, by means of which the organism is enabled to avert from itself damage from chemical poisons introduced by the mouth, or toxic substances formed in the alimentary canal—the noxious substance combining with glycuronic acid and being so excreted. The appearance then of glycuronic acid in the urine indicates merely the need of dealing with such a poison. *Homogentisic acid*—the aromatic acid excreted by those who exhibit the very rare and usually congenital error of protein metabolism known as *alkaptonuria*—is a powerful reducing agent, and alkaptonurics have sometimes been refused for insurance on this account. Of the *sugars other than glucose* which are met with in the urine, lactose, lævulose, and pentose are the most important ; whereas maltose, isomaltose, galactose, and heptose have as yet little more than an academic interest. To ensure the certain diagnosis of glycosuria, evidence should be forthcoming that the urine in question contains a dextrorotatory reducing substance, fermented by yeast, yielding an osazone of the correct crystalline form which melts before recrystallization at a point slightly above 200° C.

The classification of the varieties of glycosuria is unsatisfactory. The list of causal factors includes a medley of conditions, many of which stand in no obvious relationship to each other. A pathological classification, based on fundamental differences, includes in one class all cases in which the excretion of sugar is the outward manifestation of the presence of excess of sugar in the blood, or a hyperglycæmia ; in a second class stand those cases in which the sugar contained in the blood is normal, or below normal, and in which glycosuria must be attributed to failure on the part of the kidneys to retain the normal quantum. No English word expresses this renal shortcoming so well as the German " Durchlassigkeit."

From a clinical standpoint, cases of metabolic glycosuria fall into three main classes : those in which actual excretion of sugar does not occur in ordinary circumstances, but may be induced by a dose of glucose which would not be sufficient to produce glycosuria in an ordinary individual ; those in which spontaneous glycosuria occurs intermittently, apart from the excessive taking of sugar ; and, lastly, those in which glycosuria is continuous, or is suspended only for a time by the imposition of a more or less rigid dietary, poor in carbohydrate constituents. The dividing lines between the several groups are shadowy, and individuals may pass through all three stages.

It is now admitted that the urine of normal individuals contains glucose to the amount of 1 to 2 decigrammes in the output of twenty-four hours. Such traces, however, do not respond to the tests in ordinary use, and we speak of glycosuria only when the amount of glucose can be detected by the ordinary clinical tests. Such glycosuria

may be induced in the healthy by the administration of a sufficiently large dose of glucose—the limit of tolerance averaging 150 to 200 grams of glucose, a limit far above any test which the organism is likely to be put to in ordinary life—and it must therefore be rare for spontaneous glycosuria to occur in healthy individuals from excess of sugar in the food. No dose of starch which can be taken induces glycosuria in a normal subject—not being converted sufficiently rapidly into sugar to overtax the tolerance; when a meal of starchy food produces glycosuria, we are confronted with a definite morbid phenomenon. The individual who excretes small quantities of sugar after a meal rich in starch, and the sufferer from the gravest form of diabetes, differ only in degree, and the interval between them is bridged over by intermediate cases of all grades. It is a matter of dispute whether lowering of glucose tolerance is to be regarded as the initial manifestation of that error of carbohydrate metabolism which culminates in diabetes, or of a wholly different significance from alimentary "glycosuria ex amylo" and spontaneous glycosuria. Our present knowledge does not suffice for a final answer to this question; but it may be stated that when a patient shows lowered glucose tolerance in the course of an acute disease, it does not in any way imply that he is likely to develop diabetes later on.

In considering the *share of the various organs in the causation of glycosuria*, the author points out that we may conceive of a group of enzymes carrying on the actual work of the metabolism of carbohydrates as of other branches of metabolism. We may picture to ourselves the glands of internal secretion as directing, controlling, and supervising the work of the enzyme labourers—now restraining their activity, and now stimulating them to increased exertions. Of the several glands concerned in this work, the pancreas stands pre-eminent. We may conceive of some as helping and some as hindering the actions of others, so that, if the influence of one be withdrawn or over-powerfully exerted, the balance normally maintained is overthrown, and disorder results. Lastly, we may picture these overseer glands as themselves controlled by a still higher authority, resident in the nervous system; for the influence of the nervous system upon the glands of internal secretion hardly admits of doubt. The author gives an important résumé of cases illustrating the influence of the nervous system upon carbohydrate metabolism, and glycosuria in its relationship to disease of the pancreas. It is acknowledged that the evidence of temporary affection of the pancreas in such cases is very far from complete, although the association of glycosuria with catarrhal jaundice is certainly suggestive, and apparently transitory pancreatitis occasionally occurs as a complication of mumps. In some of those instances, sugar has been found in the urine; while in others it has been entirely absent.

The occurrence of glycosuria in connection with disease of the alimentary tract has only recently attracted much attention, but it promises to provide fruitful lines of inquiry, and holds out hope of

therapeutic advances. Recently, a number of cases of enteritis have been described where glycosuria was a prominent feature, and disappeared under treatment, leading to amelioration of the intestinal disorder.

It is well known that *exophthalmic goitre,* the symptom-complex which results from hyperthyroidism, is sometimes associated with diabetes, and more recently it has been shown that the lowering of the tolerance of glucose is by no means uncommon in this condition. The author has found that, in some cases, glycosuria follows so small a dose of glucose as 20 to 30 grams ; while in a larger number, 100 grams produced that effect. In the cases in which transitory spontaneous glycosuria occurs, the output of sugar tends to be small, and may be transient or recurring at intervals. In most cases of diabetes occurring in association with exophthalmic goitre, there is good reason to believe that the onset of the two groups of symptoms are more or less simultaneous. It can hardly be doubted that excess of thyroid secretion is the exciting cause of the glycosuria, for lowered glucose tolerance and spontaneous excretion of sugar may be induced by the medicinal use of thyroid extract. Thus, patients with myxœdema may acquire glycosuria under treatment. Out of 11 cases of myxœdema under treatment as out-patients, glycosuria was found in no fewer than four. It is a question of interest whether the thyroid gland produces its effect on carbohydrate metabolism through the pancreas. Opie inclines to the view that the glycosuria of Graves' disease is due to an associated pancreatic lesion, and such lesions have been found in fatal cases ; but the occurrence of glycosuria under thyroid administration can only be reconciled with this view if we suppose that hyperthyroidism produces the lesions of the pancreas. Falta, on the other hand, suggests that the excess of thyroid secretion exercises a check upon the function of the pancreas, either directly, or by stimulating the activity of the chromaffin system.

Like the thyroid gland, the *pituitary body* has a very important influence upon the metabolism of carbohydrates, and in acromegaly, glycosuria may occur. Some of those cases are little, if at all, influenced by restrictions of diet, whereas in others diet has controlled the glycosuria. It is a peculiar feature of the glycosuria of acromegaly that in some cases the excretion of sugar has ceased completely for a period, although the patient's diet was by no means poor in carbohydrate.

Adrenal glycosuria is a difficult and complex problem. There can be no question that adrenalin has a very definite influence upon carbohydrate metabolism. There is no sufficient evidence, however, that gross lesions of the adrenals are included amongst the causes of clinical glycosuria. It is evident from recorded cases that, given a disease which induces an excessive supply of adrenalin to the blood, hyperglycæmia and glycosuria are likely to be among the symptoms ; and the evidence suggests that adrenalin may play the chief part in

CAPT. McCARRISON'S CASES OF SIMPLE GOITRE SHOWING RESULTS OF VACCINE TREATMENT

Diminution in circumference of neck = 4·5 cm.

Diminution in circumference of neck = 4·5 cm.

regulating the glucose contents of the blood. It is at least possible that some of the cases of mild diabetes in later life may have their origin in adrenalin excess.

The effect, then, of a study of glycosuria is to obliterate the conception of diabetes as a sharply-defined disease, and to present the malady merely as the maximal phase of a series, rising by gradual steps from the normal of metabolism—just as myxœdema is the culminating point of the almost insensible grades of hypothyroidism. Between the sufferer from grave diabetes, and the potential glycosuric, there is a striking contrast; but the gulf which separates them is bridged over by intermediate cases of all degrees of severity. This being so, it follows that with the possible exception of the so-called renal glycosuria, there is no such thing as non-diabetic glycosuria, although there are many varieties which lack the sinister import which we connect with the name of diabetes. The differences are rather of degree than of kind.

REFERENCE.—[1]*Lancet*, 1912, i, 483, 557, 629.

GOITRE AND GRAVES' DISEASE. (*See also* GLYCOSURIA *and* THYROID SURGERY OF.) *Herbert French, M.D., F.R.C.P.*

Interesting results of the treatment of simple goitre by a **Vaccine** are recorded by Captain Robert McCarrison, I.M.S.[1] His investigations into the bacterial origin of endemic goitre in Gilgit led him to use vaccines in the treatment of the disease, and with most striking results. While endeavouring to cultivate amœbæ from the fæces of sufferers from this complaint, he was struck by the constant character of the bacillary growths that appeared in the medium he employed. This consisted of beef extract 0·5 gram, sodium chloride 0·5 gram, agar 20 grams, tap water 1,000 c.c., the alkalinity being minus 1. From the constancy of the bacterial growths so obtained it occurred to him to prepare a vaccine from these cultures and to employ it, as an experimental procedure in the first instance, in the treatment of recent cases of goitre. He made no attempt to isolate any particular organism, so that the vaccine employed was a composite one obtained from various organisms capable of growth on an alkaline and feebly nitrogenous medium. This vaccine was administered in doses of from 150 to 350 millions, the inoculations being made at intervals of from seven to ten days. In many cases simple goitres of large size disappeared spontaneously and completely. The accompanying illustrations from his paper (*Plate XVI*) show the remarkable changes which the vaccine treatment brought about in the thyroid gland.

Whether or not any similar treatment might do good in acute cases of Graves' disease has not yet been tested, but it has at any rate been shown by J. J. Gilbride[2] that no bacterial growths could be obtained during life from within the affected thyroid gland itself. He investigated six cases of exophthalmic goitre and eight of simple cystic goitre, and the results were all negative. This, however, by no means proves

that the affection of the thyroid gland, in some cases at least, is not due to the toxic effects of bacteria growing in the intestinal canal or elsewhere in the body, and amenable to vaccine treatment.

That the **X-rays** applied locally are of very real value in the treatment of Graves' disease is the strong opinion of L. A. Rowden.[3] He says: "Since 1905 I have treated thirty-one cases of Graves' disease with *x*-rays alone, in private and in hospital practice. Of the fourteen private cases, ten are cured and the remaining four practically well. Of the seventeen hospital cases, seven are cured, four are markedly relieved, four show very little relief, one was operated on with a fatal result after five applications, and one has only started treatment. Altogether, therefore, the cured and greatly relieved number over 80 per cent. I claim that no other method of treatment, surgical or otherwise, can show such good results in this most intractable of diseases. Here in Leeds we are coming to the conclusion that the *x*-ray is, so far, the only rational and scientific mode of treatment." (*See also page* 62.)

The time has not yet come when the practitioner can decide for himself from the published statistics whether it is wiser to adopt **Operation** in Graves' disease as the ordinary treatment for most cases, or to use the **X-rays** and other non-operative measures for the average case, operation being resorted to only for special reasons, because those who have published statistics upon the subject seem to have done so in a strongly partisan spirit. It seems, however, that notwithstanding the improvements in modern technique, even those surgeons who have the most experience of operating in these cases still have a serious immediate mortality. It is true that Kocher reckons the mortality at 3 per cent in his 300 most recent cases, and this is relatively a very low figure; others have had a higher mortality, and amongst recent collected statistics may be mentioned those of L. Rehn.[4] His cases amount to sixty-one of Graves' disease operated upon, of whom fifty-seven were women and four men. He states that forty-six cases, or 75·5 per cent, were cured, this including three patients who, after incomplete cure from the first operation of excision of the right lobe, got well after subsequent ligature of the left superior and inferior thyroid arteries. In six others, or 9·8 per cent, there was improvement; one case relapsed; but the most significant of all his figures has relatively little stress laid on it by him, namely, that eight of the sixty-one cases died of the operation, giving an immediate mortality of 13·1 per cent. He admits that it is practically impossible to say which cases are likely to prove fatal in this way, and so long as this is so the physician must have serious misgivings in recommending the operative treatment of Graves' disease.

G. R. Murray,[5] summarizing the results of the surgical treatment in ten cases at the Manchester Royal Infirmary, finds that in six of the ten cases an operation was done in order to relieve or cure the Graves' disease, and three died. In the remaining four the operation was primarily carried out for the relief of pain or dyspnœa. Of the seven

survivors, two are cured, four are improved, and one has just recovered from the operation. Notwithstanding the above apparently high mortality, he would advocate operation in all cases where there is distinct stridor from compression of the trachea or persistent pain in the goitre. In cases of a mild type he does not consider an operation is necessary. In very severe cases with marked cardiac failure the risk is too great. In a certain number of cases of moderate severity, in which no adequate improvement has resulted from medical treatment fully tried for twelve months, he would advise a partial thyroidectomy, or ligature of the superior thyroid arteries.

Miles F. Porter[6] uses a new form of treatment for Graves' disease, namely, that of injecting into the substance of the enlarged thyroid gland, by means of a hollow needle and syringe, suitable quantities of **Boiling Water,** with the idea of thereby producing inflammatory increase of the fibrous tissue of the gland and consequent atrophy of some at least of the parenchyma. This treatment is similar to that which has already been employed in the boiling-water cure of angiomata. He records four cases, and although his results so far are not conclusive, the treatment seems reasonable, and it is at any rate simple. An average dose of the boiling water would be 40 min. for each lobe of the gland, repeated at a suitable interval, and if need be, more than once. No anæsthetic is required, though some of the patients find the heat of the needle at the skin surface rather painful.

Although so little real benefit has resulted from the use of either the **Serum** or the **Milk** of **Thyroidectomized Goats** in Graves' disease, there are still observers who have not given up hope of benefit from this line of treatment. W. Edmunds[7] is amongst the recent workers in this field, and he has treated a number of cases with the dried milk of thyroidless goats. He has not found any harm result, but one cannot conclude from his paper that there was real benefit. A great objection to it is the expense. Edmunds points out that the effect (if any) of the milk or preparations made from it must depend in a considerable degree on the dosage. Clearly a sufficient dose must be given. One of the preparations is said to be made by mixing the dried milk with an equal quantity of sugar of milk, which is added as a preservative; 1 oz. of dried milk would correspond to about 4 oz. of the whole milk. If, then, 1 dr. doses of the mixed powder were given, each dose would correspond to 2 dr. of fresh milk; and if the doses were ordered three times a day they would correspond to 6 dr., or possibly 1 oz., of the milk a day. But when the fresh milk is given it is usual for the patient to take the whole yield of one goat, which may be a pint or a quart a day; sometimes a litre (35 oz.) is prescribed. If this is anything like the right dose, 3 dr. a day of the powder would be much too small. To give the powder on the scale on which the fresh milk is given would cost about 33s. a day.

Vomiting of a severe or persistent type is not a very common symptom in Graves' disease, but occasionally it is apt to prove intractable to medicinal treatment. J. A. Nixon[8] brings evidence to

show that the vomiting is not due to a local affection of the stomach, but to dilatation of the heart, being in this respect comparable to the persistent vomiting of some anæmic women. Upon this view the correct treatment would be to **Rest** the patient absolutely in bed, and to give a fairly **Normal Dietary,** rather than resort to restricted diet or even rectal feeding, as in some cases might otherwise seem necessary. In several cases that he referred to, when rectal feeding and only small quantities of milk by the mouth did not relieve the patient at all, the plan of dieting was changed and the patient was given moderate meals of solid food. She did not cease to vomit at once, but immediately after being sick ate more food, with the result that the previous acidosis rapidly passed off and the dangerous vomiting quickly ceased. Treating cases of this kind by feeding them up in spite of the persistent vomiting, whilst at the same time keeping them absolutely in bed, would seem, from Nixon's patients, to be the right course to adopt.

R. Lepine[9] once more insists upon the danger of giving **Iodine** or iodides in cases of larval Graves' disease. Whereas some such patients do not appear objectively to suffer, others are made materially worse, and that which was not a fully developed Graves' disease may become so as the result of the administration of the iodine.

Ligneous thyroiditis is an uncommon but well-defined affection of the thyroid gland that was first recorded by Riedel in 1896 as " Eisenharte Strumitis." The number of cases on record is not very great, but probably the disease would prove to be less uncommon if it were more generally recognized. A recent case has been recorded by George R. Murray and Frederick A. Southam.[10]

The symptoms of this interesting disease are due to the progressive development in the thyroid gland of a dense fibrosis, which may not only involve the capsule of the gland, but may extend to the surrounding connective tissue and muscles. In Professor Jeannel's case the fibrous tissue involved the sheath of the vessels and nerves in the neck, and extended up to the base of the skull. This tendency of the fibrosis to extend beyond the capsule of the gland serves to distinguish the condition from the chronic atrophic fibrosis which is found in myxœdema. Extension into surrounding tissues accounts for the early compression of the trachea, and the dyspnœa, which are characteristic symptoms of Riedel's disease, but which do not occur in myxœdema. As a rule, the destruction of the alveoli of the gland is not sufficiently extensive to induce myxœdema. The case recorded is of special interest in that the removal of a portion of the diseased gland, which apparently contained no normal tissue, was nevertheless sufficient in some way so to reduce the supply of the secretion that symptoms of myxœdema developed shortly afterwards.

Nothing is known so far of the cause of the disease, though the character of the microscopical changes suggests that it may be the result of some chronic infection. It occurs in both sexes, and most commonly shows itself in patients between thirty and forty years of age. The development of the disease is generally slow, but it may take

place within a few months or even a few weeks. In some cases pain has been complained of in the affected gland, radiating to the ears and the back of the neck. Dyspnœa and stridor due to compression of the trachea, which is not displaced to one side or the other, are the most important symptoms, and notable because they are associated with a comparatively slight enlargement of the gland itself, which, however, becomes hard in consistence and fixed in position. The skin overlying the gland is not adherent, and the lymphatic glands are rarely enlarged. The narrowing of the trachea may be accompanied by a laryngo-tracheitis, causing cough. One recurrent laryngeal nerve may be involved in the cervical cellulitis, causing paralysis of one vocal cord. The malady may resemble the harder forms of malignant disease of the thyroid gland. The following points are of value in distinguishing between the two. Dysphagia, which is not uncommon in malignant disease, is rare in ligneous thyroiditis. The uniform enlargement of the gland, the early onset of severe dyspnœa, the freedom of the skin from adhesion, the absence of enlargement of the lymphatic glands, and the earlier age at which it usually occurs, are all in favour of chronic thyroiditis.

Treatment.—No medicinal treatment appears to exert any influence upon the progress of the disease. When once compression of the trachea has commenced, so that there is slight stridor with dyspnœa on exertion, a sufficient amount of the diseased gland should be **Excised** to free the trachea completely. No more tissue than is necessary for this purpose should, however, be removed, so that, if possible, a sufficient amount of secreting tissue may be left to prevent the onset of myxœdema.

References.—[1]*Lancet*, 1912, i. 357; [2]*Jour. Amer. Med. Assoc.* 1911, 1988; [3]*Lancet*, 1912, i. 608; [4]*Deut. med. Woch.* 1911, 2161; [5]*Lancet*, 1912, *i*, 489; [6]*Jour. Amer. Med. Sci.* 1911, 1120; [7]*Lancet*, 1911, ii. 1618; [8]*Brit. Med. Jour.* 1911, ii, 1354; [9]*Rev. de Méd.* 1912, 663; [10]*Lancet*, 1912, i, 1188.

GONORRHŒA.

C. F. Marshall, M.D.

Diagnosis.—Irons[1] obtained a definite *cutaneous reaction* similar to the tuberculin reaction, after introduction of a glycerin extract of gonococci into the skin. In positive cases, a hyperæmic area of 5–10 mm. appears in from twelve to twenty-four hours, and sometimes also a papule. In non-gonococcal cases there is either no reaction or only a hyperæmic area of 2 or 3 mm. A combined extract of several strains of gonococci is preferred. Eising[2] found the reaction most pronounced after intradermal inoculation—a red papule often surrounded by a red areola. In a series of thirty cases the reaction corresponded to the bacteriological and clinical examinations. The vaccine used contained 100 million gonococci to 1 c.c. Stockman,[3] on the other hand, found that an injection of twenty to fifty million polyvalent gonococcal vaccine caused a slight rise of temperature; 150 millions a more distinct rise. He remarks that if the reaction symptoms develop after a sufficient dose of the vaccine, it may be

concluded that a gonococcal infection is present. But the reaction varies so much with the patient, and probably also with the vaccine used, that it is impossible to define the dose sufficient for diagnostic purposes, and this irregularity impairs its value.

TREATMENT.—Carle[4] discusses the question of abortive treatment of gonorrhœa by injections. He considers that injections have undoubted advantages over irrigations, both on account of their good results and the ease of administration. As regards the indications for abortive treatment, the diagnosis must be certain and the period early. In the case of recent gonorrhœal urethritis with the minimum of symptoms, abortive treatment by injections of **Permanganate of Potassium** is indicated; in exceptional cases, by **Nitrate of Silver.** After forty-eight hours it is better to use **Protargol,** preceded by **Ichthyol** if inflammatory symptoms are present. After the fifth day, when there is pronounced inflammation, it is too late for abortive treatment, and the author recommends expectant treatment, without injections.

Vaccine Treatment.—Stockman[3] has treated nine cases of gonorrhœal *arthritis,* and comes to the conclusion that this treatment gives no better results than other methods. He finds that autogenous and heterogenous vaccines act in the same way. As regards *urethritis,* he considers that it is not influenced at all by vaccines. Boehm[5] recommends combined **Gonococcal** and **Staphylococcus Vaccines** in certain complications of gonorrhœa, including acute gonorrhœal septicæmia, arthritis, prostatitis, and epididymitis; but in acute urethritis he considers both gonococcal vaccines and the combined vaccines harmful, because the circulation is already overloaded with toxic products. Morrow and Bridgman[6] consider vaccines useful when there is gonorrhœal arthritis, but not of much use in ordinary cases of gonorrhœa in young girls. Clayton[7] found vaccine treatment in gonorrhœal arthritis no better than the usual treatment by hot air, passive congestion, salicylates, etc. He treated ten cases with weekly injections, increasing from 5 million to 30 million cocci. The other methods of treatment mentioned were used simultaneously, and the average stay in hospital was six weeks, while in another series of nineteen cases treated without vaccines the average stay in hospital was four and a half weeks. Drobuy,[8] on the other hand, is in favour of vaccine treatment in cases where the gonococci have penetrated into the tissues, as in *prostatitis, epididymitis,* and *arthritis,* etc. In these he thinks the vaccine has a specific action. But in affections of the mucous membrane, such as urethritis and cystitis, he finds no effect. He thinks the clinical symptoms form a sufficient guide to treatment by vaccines; estimation of the opsonic index is unnecessary. In spite of the fact that the vaccines have no action on the mucous membrane, he advises this treatment to be begun as early as possible, as by this means complications may be avoided. He concludes that a combination of vaccines with ordinary treatment shortens the duration of the disease and leads to a more complete cure. The first

injection contained 20 to 25 million cocci, and subsequent doses were increased by the same amount up to 100 million cocci. In one case only, one of gonorrhœal pyelitis, the dose was raised to 200 million. In most cases the injections were given twice a week. In children, the doses varied from 2 to 8 million cocci. In most cases fifteen injections were given ; after this the gonococci had disappeared from the discharge. Drobuy's results are based on 136 cases, including acute, subacute, and chronic urethritis, cavernitis, acute and chronic cystitis, acute and chronic epididymitis, acute orchitis, vesiculitis, chronic prostatitis, chronic folliculitis, chronic pyelitis, and chronic polyarthritis.

Some account is given of **Radio-active Waters** (*page* 70), **Normal Serum** (*page* 40), and injections of **Mercuric Succinimide** (*page* 24), in the treatment of gonorrhœal arthritis.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 931 ; [2]*Med. Rec.* 1912, i, 1038 ; [3]*Brit. Med. Jour.* 1911, ii, 1465 ; [4]*Ann. d. Mal. Vén.* 1912, 513 ; [5]*Therap. Gaz.* 1912, i, 18 ; [6]*Jour. Amer. Med. Assoc.* 1912, i, 1564 ; [7]*Austrl. Med. Jour.* 1912, i, 468 ; [8]*Vratchebn. Gaz.* 1912, June (*Ann. d. Mal. Vén.* 1912, 652).

GOUT, CHRONIC. *Herbert French, M.D., F.R.C.P.*

Finzi[1] states that the effects of **Ionization** with lithium and iodine on this disease are simply wonderful, even in long-standing cases. If there is an acute attack the application of the ions will usually cut it short, the pain disappearing in a few hours. In the chronic and subacute forms, swellings disappear in the most astonishing way, and movement is recovered in joints previously stiff.

Treatment by **Radium Emanations** is advocated by balneologists.

REFERENCE.—[1]*Pract.* 1912, i, 134.

GRAFTING. *Priestley Leech, M.D., F.R.C.S.*

Transplantation of Free Flaps of Fascia.—Staige Davis[1] reports some very interesting experiments on dogs as to the possibility of transplanting flaps of fascia to remedy various defects. The fascia was obtained in most cases from the thigh ; in a few instances the strong abdominal fascia was used ; it was transplanted in both single and double layers, and in one or two instances was twisted. Where adhesions were not desired, the flap was placed with the inner or muscle surface exposed. Black silk thread was used both for ligatures and sewing.

Free fascia flaps were successfully transplanted into the subcutaneous tissue, into fat, on muscle, periosteum, bone, cartilage, tendons, and ligaments. Microscopical examination showed that the fascia retained its own structure after transplantation, and was apparently healthy and well nourished, even after it had been kept in cold storage for thirty-five days and then transplanted into another animal. These flaps can thus be used to bridge muscle and tendon defects. They are not liable to adhere, and might be employed to prevent tendons being caught in scar tissue.

In another series, flaps were successfully transplanted round arteries, veins, and nerves, without in any way interfering with the lumen of the vessels or compressing the nerves. Clinically, fascial flaps might be used in protecting suture lines in vascular surgery, and in reinforcing weakened areas in vessel walls. The site of nerve plastic operations might be surrounded and protected by such flaps; and it might be used for protecting a nerve after it had been freed from callus or scar tissue.

Free flaps of fascia were transplanted into joints and to take the place of patellæ which had been removed. They can also be inserted into skull defects between the dura and bone edges, for they will heal and give a strong membrane which will resist considerable pressure from within and without. When the dura is removed in addition to the bone, the fascial flap, tucked under the bone edges, will unite with the dura and also become tightly adherent to the bone edges. In each instance a single fine adhesion of the cortex to the centre of the fascial flap was seen. This shows that free flaps of fascia may be successfully used in clinical surgery to cover prepared defects in the skull, in closing spina bifida, in covering defects in the trachea, e.g., old tracheotomy wounds where there has been considerable destruction of cartilage, and also in reinforcing sutures of the trachea.

In another group of experiments, portions of the abdominal wall, excepting the skin, were excised, and the gap filled in with fascia. In no case was there adhesion of the gut or any other abdominal organ to the fascia.

When a hernia was produced by removal of a portion of the abdominal wall, excepting the skin, it was readily cured several weeks later by the transplantation of fascial flaps. This suggests their use in the cure of large herniæ where the muscle is atrophied, and also in the strengthening of any weakened area in the abdominal or thoracic wall. The facility with which fascia unites with the peritoneum suggests its further use in pleural and pericardial defects.

Flaps were successfully transplanted on to the stomach, intestine, and bladder, and might be used to strengthen suture lines and weakened areas due to ulceration in the gastro-intestinal tract. They might be suitable for closing fistulæ.

The flaps were also successfully grafted on the liver, kidney, and spleen, and might be used to support sutures in these organs and also to bind raw post-operative surfaces. When applied to a bleeding surface it seemed to have a definite hæmostatic effect. The kidney or spleen might be suspended to the ribs or muscles in a sling of free fascia.

There is some difference in the size of the flaps before and after removal; they shrink more or less. Where there was tension on the transplanted flap, there was comparatively little subsequent thickening, but wherever the fascia was simply laid on a tissue, there was always thickening, and unless it was held flat with sutures it had a tendency to bunch or roll up.

Fascia was successfully transplanted into the same and other animals after being kept in an ordinary ice chest at 38° C. for as long as seven days, in cold storage at 32° C. wrapped in gauze moistened with salt solution for thirty-five days, and in cold storage at 32° C. in normal salt solution for fifty-six days. If kept in salt solution, fascia appears œdematous when first removed, but the œdema disappears when the tissue is pressed with dry gauze.

Alex. MacLennan[2] suggests a modification of the usual *skin grafting*, which has given him better results. The *modus operandi* is as follows:

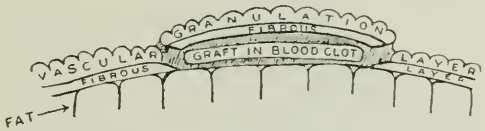


Fig. 66.—To show graft embedded (cross section).

The previous day the skin to be transplanted is scrubbed with soap and hot water, well soaked in methylated spirit, and covered with a dry sterile dressing. Before removing the graft, rub again with spirit and dry with sterile gauze. The graft may be a mere shaving, or the entire thickness of the skin. The subcutaneous fat is not raised with the graft; it may have to be excised in order to close the wound; the graft is placed in saline and the wound closed. The graft is then cut into little strips a quarter of an inch wide and about three-quarters of an inch long.

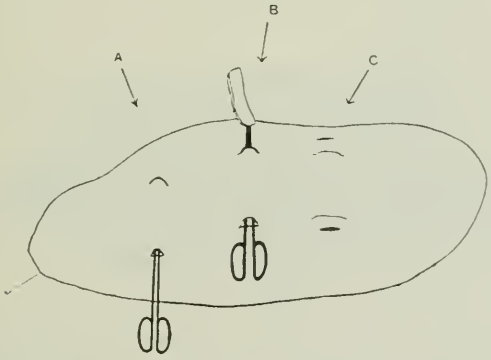


Fig. 67.—A, Forceps tunnelling under granulations. B, Forceps grasping graft. C, Graft embedded.

The ulcerated surface to be grafted is then tunnelled beneath the granulations by a pair of forceps, which is used to pull the graft into the tunnel (*Fig.* 67). This should be just wide enough to compress the graft lightly. If wide strips are employed, too much of the granulation tissue is raised, and it sloughs too soon. Bleeding is often profuse, and in some vascular parts it is advisable, if possible, to

perform the manœuvre after the region has been rendered anæmic by Esmarch's bandage.

If the granulations are old, it will be found that a dense fibrous layer carpets the ulcer, and it is desirable to tunnel under this layer. If any difficulty be found in getting under it with the forceps, a scalpel should be used instead. It is better to tunnel too deep than too superficially. This same method may be used where cicatricial contractures have followed healing, and when the graft is firmly fixed the superimposed bridge of scar tissue is divided; two narrow strips are better than one wide one.

The graft lies in a blood clot, and the superimposed granulation tissue, if not disappearing, may be caused to shrink by the use of **Blue Stone.** MacLennan used a paste of **Boric Acid** and **Glycerin,** spread on lint, as a dressing. If a large surface is covered, the urine must be watched for hæmoglobinuria due to glycerin absorption.

Staige Davis[3] considers that skin grafting is too much neglected by surgeons. Reverdin, or Thierisch, grafting may be practised, and he uses a network of open tissue soaked in rubber solution to place over the grafts. He recommends the use of **Scarlet Red Ointment** or **Amido-Azotoluol** in granulating surfaces as the best means of stimulating the growth of epithelium. A mixture of castor oil containing 10 per cent of alcohol will take up 4 per cent of scarlet red and 8 per cent of amido-azotoluol; this may be applied with a brush. Since using the dye, which is insoluble in water, he has not noticed its excretion by the kidney.

REFERENCES.—[1]*Ann. Surg.* 1911, ii, 734; [2]*Glasg. Med. Jour.* 1912, ii, 86; [3]*Bost. Med. and Surg. Jour.* 1912, i, 843 and 891.

GRANULOMA PUDENDI. *Leonard Rogers, M.D., F.R.C.P.*

Donald Steel[1] records his experience of this disease in the Western Australian Lock hospitals. In the deeper tissues of some cases he found spirilla resembling those of syphilis, but cannot say if they are constant factors. In others, in the enlarged lymphatic glands an organism with a rod-shaped nucleus and surrounding protoplasm was met with. Possibly there are two different diseases present. Three monkeys infected over the eyebrows with material from cases, showed granulomata, and died with cachexial symptoms. Wassermann's test gave positive reactions in 80 to 90 per cent of the cases.

TREATMENT.—Mercury and iodides have been used for long periods without effect, while vaccines of the various organisms in the ulcers also failed. Injections of various arsenical preparations produced only very temporary benefit. On the other hand, **Salvarsan** intravenously had a very marked, and often immediate, good effect where all other measures had failed. It should be followed by **Excision** of as much of the growth as possible. Treatment with **Caustics** has a limited value, chromic acid and silver nitrate being the best. During this investigation about 300 cases were under observation for from thirteen to fourteen months.

REFERENCE.—[1]*Lancet,* 1912, i, 225.

GRANULOMA TELEANGIECTODES EUROPEUM.

Herbert French, M.D., F.R.C.P.

An affection, particularly of the fingers, characterized by the local overgrowth of what seems to be exuberant granulation tissue, though it may also to some extent simulate sarcoma, is not altogether uncommon either in Britain or on the Continent, and it has recently been investigated in some detail by Hermann Schridde,[1] who finds evidence that even in those cases in which this peculiar affection occurs in persons who have not been out of Europe, there is present

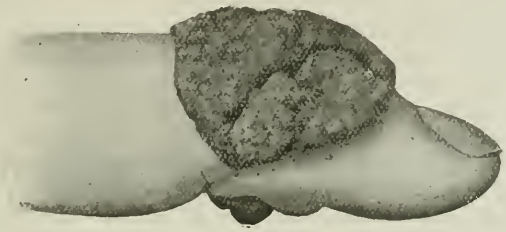


Fig. 68.—Protozoal Granuloma—External appearance.

a causal protozoan which is comparable to, if not identical with, the protozoa that have been described in various Oriental sores, Aleppo boils and so forth. The affection is illustrated in *Figs.* 68, 69.

The overgrowth of granulation tissue produces an appearance on the skin not unlike that of an adherent reddish fungus. It grows very slowly as a rule, but as time goes on it spreads both superficially

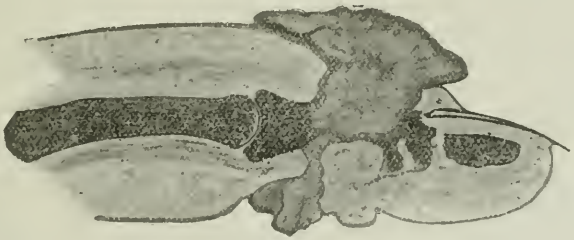


Fig. 69.—Protozoal Granuloma—Macroscopic appearance, on section.

and deeply, and, as shown above, it may penetrate to and destroy the underlying bone. It is not surprising that former observers have mistaken the growth sometimes for sarcoma, but microscopically it presents most of the appearances of granulation tissue containing abundant blood-vessels. It has on this account been termed granuloma teleangiectodes, and it has been compared by some to verrugo peruviana. Schridde gives a full description, with illustrations, of what he believes to be the causal protozoa; certain it is that the

affection is different from what is ordinarily produced by such cocci as lead to inflammation, so that his contentions seem not at all improbable. Further investigations are needed to confirm what Schridde suggests.

REFERENCE.—[1]*Deut. med. Woch.* 1912, 218.

GUNSHOT WOUNDS.

(*Vol.* 1912, *p.* 586)—Berry's admirable account of his wide experience in this direction is very fully reviewed here.

HÆMATURIA. *Francis D. Boyd, M.D.*

"*Essential Renal Hæmaturia*" is the title given to bleeding, usually from one kidney only, and as a rule associated with pain, and not due to any of the well-understood causes of renal hæmaturia. Hale White[1] makes reference to the more important papers published since 1907, and records five cases from Guy's Hospital in which the kidney had been explored on account of hæmaturia, and found healthy.

From his own cases, and the recorded literature, the author finds that the condition occurs in both men and women. The patients are nearly always between the ages of twenty and forty, and usually under thirty. It is very rarely fatal, and although no doubt the hæmorrhage sometimes ceases spontaneously, it so often stops after nephrotomy that it is difficult not to regard the operation as often beneficial. Nephrectomy should not be undertaken unless the patient's life is in danger from loss of blood. Why a nephrotomy does good, we cannot say, for we do not know the cause of the hæmorrhage. There seems no support for the suggestion that the patients suffer from hæmophilia; they do not bleed from elsewhere; the hæmaturia does not follow injury, nor does it occur in families. There is no reason for calling it angioneurotic or neuropathic, and doing so does not help us to understand it. Vicarious menstruation does not aid us, for many of the patients are men. The author agrees with Senator in his opinion that bleeding may take place from a kidney which to the naked eye and microscope is quite normal.

REFERENCE.—[1]*Quar. Jour. Med.* 1911, 509.

HÆMOGLOBINURIA, PAROXYSMAL. *Francis D. Boyd, M.D.*

Moss,[1] from the Johns Hopkins Hospital, contributes blood studies in three cases of paroxysmal hæmoglobinuria. The serum of the patients was found to contain a complex hæmolysin of amboceptor-complement nature, capable of bringing about the solution of the patient's own corpuscles, the corpuscles of other paroxysmal hæmoglobinuric patients, and of all other individuals, as far as tested. Patients suffering from paroxysmal hæmoglobinuria are not confined to one group, as determined by the iso-agglutination reaction, and their serum may contain normal iso-hæmolysin in addition to the hæmolysin characteristic of their disease. Only the amboceptor-complement hæmolysin of paroxysmal hæmoglobinuria is peculiar to the disease; the complement differs in no way, as far as tested, from

that present in normal serum. The red cells of the three cases reported showed a variable and easily increased resistance to hypertonic salt solution—never less than that of normal corpuscles.

All three cases gave a positive Wassermann reaction. One case was treated with **Salvarsan**, with marked improvement in the incidence of the attacks under exposure to cold, though the Wassermann reaction remained positive.

REFERENCE.—[1]*Johns Hopkins Hosp. Bull.* 1911, 238.

HÆMOPHILIA.

Treatment with **Normal Serum** is recommended (*page* 39) ; also with **Thrombokinase** (*page* 42).

HÆMOPTYSIS, NON-TUBERCULOUS. *J. J. Perkins, M.B., F.R.C.P.*

CAUSATION.—Garel and Gignoux[1] find the most frequent source of hæmorrhage in varices at the base of the tongue, which should always be looked for. These hæmorrhages are as a rule slight, but may be sufficiently abundant to simulate true hæmoptysis. Much less frequently hæmoptysis may be due to pharyngitis, especially from the congestion of the pharynx which accompanies albuminuria and glycosuria. Hæmorrhages of similar causation may occur from the larynx ; apart from distinct lesions of the larynx, they may result from purely congestive conditions in the course of Bright's disease or cirrhosis of the liver, or from menstrual congestion. Much more rarely the hæmorrhage may come from the trachea under similar conditions. In about a third of the cases the source of the hæmorrhage must be located in the lung, where (apart from distinct cardiac or pulmonary lesions) gouty, nervous, or menstrual affections similar to those already described may give rise to hæmorrhage. The relative frequency of these various causes of recurrent hæmoptysis is shown in the following figures of 128 cases : varices at the base of the tongue, 68 ; pharyngeal hæmorrhage, 3 ; due to albuminuria, 10 ; to diabetes, 7 ; to hepatic conditions, 2 ; hysterical or nervous hæmoptysis, 12 ; due to arthritic causes (gout) 5 ; to menstrual congestion, 3 ; cause unknown, 18.

DIAGNOSIS.—In such cases pulmonary disease should first be excluded by a careful examination of the lungs ; the upper air-passages should next be examined, the pharynx first, and then (with the laryngeal mirror) the base of the tongue, the larynx, and the trachea. Frequent spitting of blood in small quantity without much cough suggests the upper air-passages as a source. But little reliance can be placed on the quantity expectorated, as copious hæmorrhage may occur from the upper air-passages while pulmonary hæmorrhages may be quite insignificant.

TREATMENT.—The best treatment for this class of hæmorrhage is the application of the **Galvano-Cautery**, wherever the bleeding source is within reach.

REFERENCE.—[1]*Med. Rev.* 1912, 189.

HÆMORRHAGES IN THE NEW-BORN.

Frederick Langmead, M.D., M.R.C.P.

Etiology.—This is still uncertain. Syphilis, hæmophilia, or cerebral injury cannot explain the symptoms except perhaps in a small proportion of the cases. The view that it is due to some congenital defect in the chemistry of the blood has found many adherents. Thus W. W. Duke[1] has pointed out that there is a marked diminution of blood-platelets, and that if these be supplied by transfusion, the bleeding stops, to recur as they become reduced in numbers. This scarcity of blood-platelets has also been noted by J. H. Richards.[2] It is supposed that prothrombin is derived from blood-platelets, and that consequently in melæna neonatorum it is formed in quantities too small for adequate coagulation to occur. This is supported by the truth that the coagulability of the blood is usually defective, and that sometimes no coagulation occurs at all. On the other hand, J. E. Welch[3] has shown that the blood of these patients may be caused to coagulate rapidly by mixing it with normal serum. This has given rise to the belief that it lacks a kinase or activating agent, which is supplied by the serum.

There are two difficulties in accepting any congenital defect in the blood coagulability as the explanation: in the first place, the coagulation-time is not prolonged in every case; and secondly, the babies are usually born in good condition, so that the defects which give rise to such serious symptoms after birth can hardly have been present during intra-uterine life (W. R. Nicholson[4]).

Recently the condition has been ascribed to the action of toxins. J. E. Welch believes that these are often derived from the bowel and produce hæmorrhage by interfering with the nutrition of the endothelium of the capillaries. The more acute cases are probably due to a septicæmia. Nicholson also attributes the condition to septicæmia, and regards the bowel as the source in most cases.

Treatment.—Some success has attended the administration of **Gelatin,** either orally or subcutaneously. By the mouth it may be prescribed thus:—

℞ Gelatini	gr. xxx	Aq. dest.	℥iij
Sodii Chlor.	gr. ij		

One drachm every hour.

The most satisfactory results have followed **Transfusion** or the **Injection of Human Serum.** Beth Vincent[5] records six cases treated by transfusion, all of whom recovered. By means of coated glass tubes he connected the radial artery of the donor with the infant's femoral vein in two cases, and with the infant's external jugular vein in four. He prefers the latter method, because the external jugular vein is much more accessible. J. E. Welch has employed normal human serum, injected subcutaneously, in several cases, fifteen of which he reports in detail. All recovered. Nicholson and Richards each record a successful case. The serum may be obtained by performing a simple venesection and allowing the donor's blood to run into a

sterile flask; when the clot has separated, the serum is ready for use. From ½ to 1 oz. or more may be injected every four hours. It is claimed that there is no danger of anaphylaxis, for this serious complication occurs only if sera other than human are used. (*See also page* 39.)

REFERENCES.—[1]Quoted by J. E. Welch, *Therap. Gaz.* 1912, 81; [2]*Med. Rec.* 1912, i, 68; [3]*Therap. Gaz.* 1912, 81; [4]*Ibid.* 77; [5]*Boston Med. and Surg. Jour.* 1912, i, 627.

HÆMORRHOIDS. *Sir Charles B. Ball, Bart., M.A., F.R.C.S.*

Græme Anderson[1] records five cases apparently showing that the application of **Solid Carbon Dioxide** is suitable only for small uncomplicated internal piles, in which the results are very good. A general anæsthetic is given, the sphincter is dilated, and the piles are drawn down by pressure forceps; a crayon of carbon dioxide snow is then applied with moderate pressure for twenty seconds to each hæmorrhoid in turn, a white saucer-like depression being produced where the crayon has been applied. The frozen tissues are returned within the anus, and a simple gauze dressing is used. No pain should be experienced. The bowels can be opened on the third day, and the patient allowed up after that time.

Two of the five cases were simple, and were satisfactorily cured, but in the other three, which were more extensive, further operation became necessary.

The use of **Zinc Ionization** is alluded to on *page* 72.

REFERENCE.—[1]*Brit. Med. Jour.* 1912, i, 120.

HAY FEVER. *George L. Richards, M.D.*

Dunbar[1] still recommends the use of **Pollantin** in liquid form or as a powder or salve. It is to be applied in small amount to the mucous membrane of the eye, nose, or mouth before any phenomena of hay fever appear. Albrecht,[2] after observation of a series of hay-fever patients treated with Dunbar's serum or powder (pollantin) over a period of years, comes to the conclusion that immunization, partial or complete, is eventually brought about, the attacks finally ceasing or becoming much less violent. The cases were under observation from three to four years, and during the last year all were free from symptoms.

Freeman[3] endeavours to obtain immunity in hay fever by inoculations of **Pollen Toxin**; the doses of vaccine are determined according to the ophthalmo-reaction obtained from the initial dose of ⅓ c.c. of pollen toxin (*Phleum pratense*—Timothy grass). The dose is selected which will give the greatest increase to the immunity of the patient. It is advisable not to increase the dose quite as rapidly as the increase in the ophthalmo-reaction, especially at first. Later in the treatment, the reaction ceases to rise so quickly. Lastly, in very highly immunized patients, the reaction may at last become stationary, but the dose is still increased. Inoculations are made at intervals of a week or ten days, the larger doses being given at longer intervals, the smaller

every three or four days. Patients treated phylactically usually finish treatment after the fifth or sixth dose; prophylactic inoculations require numerous doses, since an attempt is being made to secure as high an artificial immunity as possible. Twenty cases are reported upon, fifteen of which were satisfactory, and the rest more or less disappointing.

References.—[1]*Ann. Otol.* 1912, June; [2]*Deut. med. Woch.* 1912, May 9; [3]*Lancet*, 1911, Sept.

HEADACHE. *Purves Stewart, M.D., F.R.C.P.*

Within recent years considerable attention has been directed to the diagnosis and treatment of headaches of toxic origin, also to those dependent on circulatory changes within the brain, and to the headaches of gross intracranial lesions, whilst the subject of migraine has been treated in great detail in numerous publications. English-writing observers, however, have directed comparatively little study to the important group of "*rheumatic*" headaches, notwithstanding the frequency with which they occur in practice. Hartenberg[1] and Rose,[2] in France, and Müller,[3] in Germany, have called special attention to this group, and it may be useful to give a short account of their clinical phenomena.

Symptoms.—In a case of rheumatic headache, if we examine the patient carefully, we observe signs of chronic rheumatic myositis in the muscles of the neck and scalp. The cervical muscles are found somewhat swollen and tender on pressure. The tendons and aponeuroses of attachment of the various muscles are similarly tender. If the myositis is in a subacute stage, the swelling is soft and elastic; whereas on palpation of older chronic cases, indurated resistant nodules are found embedded in the substance of the muscles. Old-standing indurations and recent soft swellings may co-exist in the same muscle, e.g., within the sternomastoid. Besides the foregoing signs of nodular myositis, we may feel, rolling under our fingers, enlargement and hardening of the cervical lymphatic glands. .The skin itself may feel thickened and infiltrated. Patients with the foregoing physical signs complain of pains in the head and neck, either spontaneous in origin or with a history of antecedent exposure to cold or damp. That such pains are really muscular is shown by the readiness with which they yield to suitable treatment applied to the muscles. The nodular infiltrations are found histologically to consist in a proliferation of connective-tissue cells, at first soft and œdematous, later dense and fibrous, together with peri- and endo-arteritis. All these indurated areas are extremely tender. Slight pressure, sudden movement, a tiring posture—all induce acute pain. Moreover, spontaneous pains occur under the influence of cold, fatigue, damp, etc. The pain and local tenderness also affect the tendinous insertions and fasciæ, in which similar tender nodules can be made out. Müller lays particular stress on the presence of a condition of hypertonus in the affected muscles. The head and

neck are stiff and immobile, as if frozen *en masse*. This rigidity is probably a defensive reflex, whereby sudden stretching of the muscles is avoided. Lastly, Hartenberg calls attention to the frequent co-existence of chronic arthritis in the intervertebral joints, so that movements of the head and neck may be accompanied by creaking which can be readily felt by the observer. Müller suggests that the internal jugular veins may be compressed by the swollen muscles, and may thereby produce a degree of cerebral congestion with head-ache. The evidence in favour of this statement is, however, far from conclusive, and the main mass of the pain in the head and neck in such cases is probably due to implication of the sensory nerves of the affected muscles.

TREATMENT.—There are several useful methods, of which the first is **Massage.** Judiciously applied by skilled hands, this usually causes the indurated patches to disappear in time. Unfortunately it sometimes produces a transient exacerbation of the tenderness before relief is attained.

Galvanism applied to the affected muscles is extremely useful, and has the advantage of being painless when properly applied. Either the simple galvanic current may be used, or **Ionization** by means of **Iodides** or **Salicylates.**

Hot Applications, combined with gentle massage, are also highly soothing. In the way of drugs, **Salicylates** or **Aspirin** in full doses are valuable. Inasmuch as rheumatic myositis is commonest in those who lead a sedentary life, regular exercise and careful attention to diet and to the processes of digestion are of the utmost importance.

REFERENCES.—[1]*Presse Méd.* 1912, 134; [2]*Sem. Méd.* 1911, Mar. 29; [3]*Deut. Zeitsch. f. Nervenheilk.*, 1910, xl, Nos. 3 and 4.

HEART, DISEASES OF. (*See also* ANGINA ABDOMINIS; AURICULAR FIBRILLATION; PERICARDITIS.) *Carey Coombs, M.D., M.R.C.P.*

SYMPTOMS AND SIGNS.—Manges[1] gives examples of cardiac *pain* referred to the epigastrium. A large heart may cause it by downward pressure; it may also be provoked by hepatic or gastric congestion. Abdominal pain may be caused by visceral arteriosclerosis, which is of course commonly accompanied by cardiac disease (*see* ANGINA ABDOMINIS). In mitral stenosis, dull pain along the left costal margin is sometimes complained of. Pericarditis may, whether in the effusive or in the adhesive form, provoke epigastric pain. [Perhaps this is sometimes due to infection of the subdiaphragmatic peritoneum.—C. C.] Last, but not least, the pain of true angina is not seldom referred to the epigastrium.

The symptomatology of *sudden coronary obstruction* has been described by Hochhaus[2] and Herrick.[3] The former says it should be suspected when an unusually severe attack of angina is followed by rapidly progressive failure of the heart; the latter, that an accurate symptomatology cannot be drawn. Death may be immediate, or postponed for the time. There is intense collapse, and if vomiting

and abdominal distension be also present, the picture may be that of an " acute " abdomen. Pericarditis may develop later, as a sequela of the myocardial infarction.

Barber[4] has witnessed paroxysms of *nocturnal dyspnœa* as an early symptom of senile cardiosclerosis, in a series of cases. The patient goes to bed apparently in good health, but is seized with intense dyspnœa like that of asthma, between 1 and 2 a.m. as a rule. There is no pain, but a sense of a retrosternal obstruction in breathing ; cyanosis is not remarkable, nor fullness of veins. The attack passes off, and next morning the patient wakes free from distress.

McKisack[5] brings forward figures to show that *mitral regurgitation*, as evidenced by a well-defined systolic murmur at the apex, is chiefly a myocardial, not a valvular change. Gallavardin's[6] thesis is much to the same effect ; he argues that the mitral apparatus may be rendered incompetent by disease of the myocardium, of the valvular curtains, or of both. In other words, he argues that the mitral valve may fail in its function of preventing regurgitation because the fibromuscular ring around the valvular orifice is stretched, because the endocardial flaps are shortened by cicatricial contraction, or by a coincidence of both changes. [A comparison of clinical and post-mortem data shows that the myocardial factor is the important one, and that disease of the cusps is rarely if ever responsible of itself for mitral incompetence.—C. C.] Riesman[7] finds that a mitral regurgitant murmur often develops during an attack of biliary colic, ceasing when it is over. He attributes this to two factors : toxins from the infected bile-passages poisoning the myocardium ; and arterial hypertension provoked by the attack of colic stretching the damaged muscle. His conclusion is that the presence of such a bruit does not contraindicate surgical treatment, but rather the reverse.

Sachs[8] has found that Stern's position—a recumbent one with the head lower than the line of the body—is helpful in bringing into prominence the systolic murmur heard at the lower end of the sternum in *tricuspid regurgitation*, in cases in which it is otherwise inaudible.

Arrhythmia. (*See also* AURICULAR FIBRILLATION.)—The study of irregularity of the cardiac action has become a science within a science ; it is already divorced to some extent from practical medicine, and though the studies now being pursued will doubtless discover facts of importance for the diagnosis and management of disease, the work of the past year has added but little of immediate clinical value to those data which have been summarized in recent volumes of the ANNUAL.

That *sinus irregularity* is no evidence of cardiac disease is well known. It is caused by variations in the rate of production of stimuli at the " top " of the heart, the sino-auricular node, and is frequently met with in children, as the papers of Windle[9] and Friberger[10] show. The former says that it can usually be recognized on clinical grounds (variation in the respiration and excitement, absence of other signs of cardiac disease), but that sometimes a polygraph tracing is necessary. This shows that the whole heart participates in the irregularity, which

consists merely of a variability in the length of the diastolic pauses. Friberger thinks that nervous and convalescent children are no more liable to this irregularity than healthy ones. Lastett[11] describes three cases in which a high grade of this form of arrhythmia developed under the influence of digitalin.

Slowing of the whole heart is similar in nature and origin to the commoner forms of sinus irregularity; it is due to slow production of stimuli at the sino-auricular node, which "makes the pace" for the whole heart. In Dumas'[12] case faint attacks were exceptional; but they do occur, and then it is only by means of graphic records that a diagnosis of heart-block can be safely excluded. In this instance ventricle followed auricle in normal sequence, as the polygram and electrocardiogram showed, whereas if the case had been one of heart-block there would have been more or less dissociation between the auricular and ventricular systoles. The pulse was quickened by atropine and exertion; the patient was healthy and free from signs of cardiac disease. The bradycardia of jaundice is also a sinus arrhythmia, as the investigations of Danielopolu[13] indicate.

In relation to *extrasystolic arrhythmia*, the most significant results are those of Lewis and Silberberg,[14] who found that electrocardiograms of premature contractions obtained in repeated examinations of the same patients show a remarkable constancy of outline; this fact is regarded as evidence of the constancy and limitation of the focus of irritation in which they are produced.

Two facts in relation to *paroxysmal tachycardia* are emphasized in recent papers. Turnbull and Lewis[15] record a case in which it appeared from the jugular tracings that the abnormally rapid rhythm arose from some spot of ectopic stimulus production within the ventricle; an electrocardiographic examination showed, however, the impulses had a supraventricular origin (i.e. in the auricle, *a-v* node, or *a-v* bundle). Lewis[16] has also confirmed the work of previous investigators, namely, that the effect of digitalis on paroxysmal tachycardia arising in the auricle may be at first to provoke auricular fibrillation, which afterwards passes into the normal rhythm. In the same paper he records a case of paroxysmal tachycardia in which the radial pulse and the ventricles were beating 150 per minute, and the auricles (as shown by the electrocardiogram) at 300 per minute, every other auricular stimulus being therefore hindered from passing over into the ventricle.

Of *heart-block* little has been written. Cowan, Kennedy, and Fleming[17] have recorded an example in diphtheria, post-mortem examination discovering lymphocytic foci in the main stem of the bundle of His; and Butterfield[18] reports a case of acute rheumatic carditis associated with partial heart-block, in which the bundle was the seat of foci of the type characteristic of active cardiac rheumatism. On the other hand, Price and Ivy Mackenzie,[19] in a case of diphtheria with clinical evidences of heart-block, found no definite lesion of the bundle.

Diagnosis.—Austin and others[20 21] consider the *Crehore micrograph*

advantageous as a recorder of cardiac sounds and circulatory movements, because of its extreme delicacy; but on account of its complexity it cannot be regarded as suitable for ordinary clinical use. Its principal field is therefore that of research, to check and explain polygraph findings.

Gott and Rosenthal[22] describe a new method of cardiac examination which they call the "*Röntgenkymograph.*" The photograph plate or film, placed in a carrier, is passed at a rate registered by a time-marker across a lead foil screen with an aperture fixed opposite to the *x*-ray tube and over the border of that part of the cardiac musculature of which the movements are being studied. The result is a continuous curve marking the fluctuations of the part of the heart under examination (left ventricle, right auricle, or aorta). These are interestingly similar to the polygraph curves obtained from the apex beat, the jugular vein, and the radial artery, respectively.

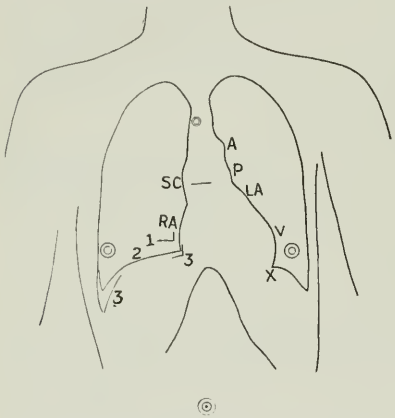


Fig. 70.—Normal heart, female patient, aged 82. 1. In deep expiration. 2. In tranquil inspiration. 3. In deep inspiration. A, Curve of aorta. P, Pulmonary curve. LA, Left auricular curve. V, Left ventricular curve. SC, Curve of superior vena cava. RA, Curve of right auricle. The position of the episternal notch, level of third chrondo-sternal articulation, the nipples and umbilicus shown. X indicates the position of the apex-beat.

The value of *electrocardiography* has been freely discussed during the year, at meetings of the Royal Society of Medicine[23] and the Chelsea Clinical Society.[24] A full account of the principles on which the method is founded appears in a paper by Einthoven,[25] the inventor of the string galvanometer. As these principles have been stated in previous volumes, there is no need to repeat them here. Lewis[26] and Nicolai[27] give full accounts of the clinical application of the method; the former stating, with a pardonable excess of enthusiasm, that the clinical examination of a case of cardiac disease ought not to be considered complete unless an electrocardiogram has been taken.

Orthodiagraphy as a diagnostic method has been carefully tested by Fowler and Ritchie.[28] They find it a rather more accurate index of the size of the heart than percussion, and especially valuable in determining the presence and size of deep-seated aneurysms. The accompanying diagrams will illustrate their findings. Incidentally they remark that palpation of the leftward extent of the apex beat will often give a more accurate idea of the position of the left border of the heart than percussion.

Prognosis.—Bradshaw,[29] in a masterly paper on the outlook in

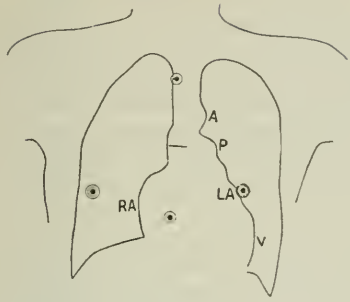


Fig. 71.—Female, aged 32, mitral stenosis, with physiological rhythm. The pulmonary curve is particularly prominent.

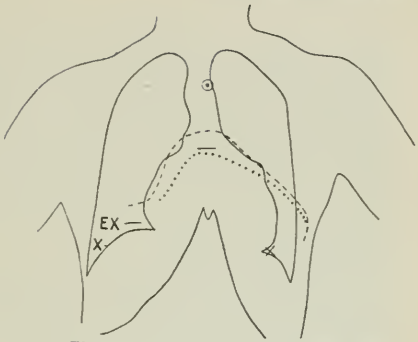


Fig. 72.—Female, aged 25, mitral stenosis, with auricular fibrillation. A large globular heart. ------ The deep percussion dullness of the heart. . . . . The superficial percussion dullness.

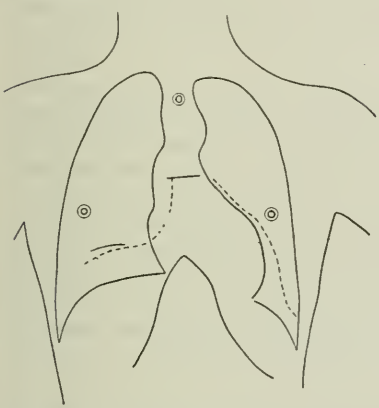


Fig. 73.—Male, aged 23, aortic incompetence. ------ The deep dullness.

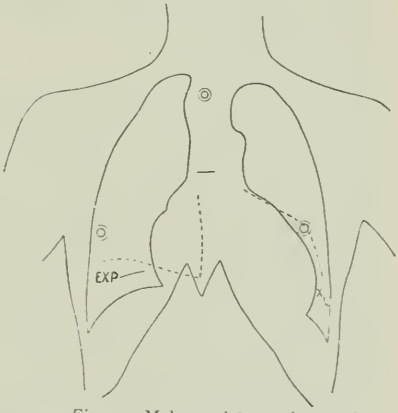


Fig. 74.—Male, aged 61, aortic and mitral incompetence. X, The position of the apex-beat. ------ The deep percussion dullness.

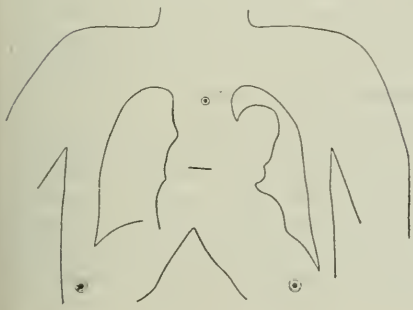


Fig. 75.—Aneurysm of descending thoracic aorta.

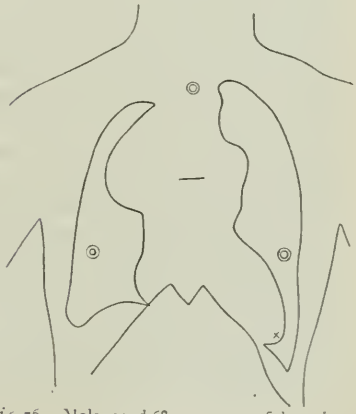


Fig. 76.—Male, aged 68, aneurysm of thoracic aorta.

valvular disease, says that in the absence of chlorosis or other analogous state, a murmur persisting for weeks or months, with its point of maximum intensity at any of the recognized areas, must be accepted as evidence of an organic defect, whether or not it be attended by other signs or symptoms of cardiac disease. The gravity of valvular disease varies between, on the one hand a handicap which is scarcely appreciable, and on the other, a threat of impending dissolution. The task of the physician is to determine where on the scale the individual case should be placed.

In regard to *rheumatic lesions*, he observes that it is not till the temperature and the joints have been normal for some weeks that a prognosis is possible. If at that time the heart is manifestly enlarged and the pulse is rapid, the outlook is bad, and the heart will be permanently crippled. In a child, growth will be retarded, and life hardly prolonged many years. If, however, though the murmur remains, there is no marked enlargement of the heart and the pulse is slow and regular, the case comes into the category of stationary established lesions.

He summarizes his experience in a series of figures which show that nearly one-half of the subjects of valvular disease, in whom failure of compensation will ultimately occur, enjoy freedom from serious symptoms for fifteen years after the initial lesion. In men, the chief incidence is in the first twelve years ; in women, there is tendency to postponement. Half of the men may be expected not to break down under twelve years, half of the women break down between the ninth and the twenty-first years. The chance of escape for the average period of fifteen years is about the same in both sexes. Aortic cases are particularly liable to show failing compensation during the first few years : if they do not, they are just as likely as mitral cases to maintain full compensation for many years.

As regards the *age* at which compensation is likely to fail, in about one-half of the cases the first breakdown occurred before the age of thirty-one. This holds in both sexes. In aortic disease there is a tendency for the cases to fall into two groups, the failure of compensation appearing either at the beginning of adult life or well on in middle age. Out of the whole series of cases believed to have originated before the degenerative period, sixteen—13 per cent—reached the age of forty-eight or upwards before a breakdown occurred. There are good grounds for believing that these figures, by no means discouraging to those who have sustained a valvular lesion, would be still more favourable if they were drawn from a wider area.

In post-rheumatic cases, the most frequent event which seemed to determine the onset of dyspnœa, or the actual breakdown, was an intercurrent attack of rheumatism. Out of 77 cases of mitral stenosis in women, cerebral embolism occurred in six, of whom two succumbed to a second attack. He thinks that the evil effects of pregnancy and parturition are less than some writers would have us believe.

In each individual case the physician must ask himself certain questions. Is the damage likely to remain stationary or to extend? Is it great or small? Is the muscular power adequate to compensate the effects of the lesion; and if so, is it likely to continue to be so? If the answers are satisfactory, then a favourable prognosis is justifiable.

He has been impressed by the unsatisfactory results of the treatment of cases that appeared to be of syphilitic origin.

He says that if a murmur be found accidentally during routine examination, the patient should not be told unless he asks; though it is advisable to tell a friend, if a reliable one be available. If the patient asks, he should be told that there is an unusual sound which may be ignored; unless the condition is one calling for treatment, when it will of course be necessary to give some brief explanation.

TREATMENT.—The **Balneological** treatment of cardiac disease receives more respect in Germany than in Britain. At a recent congress in Berlin[30] no fewer than sixteen speakers contributed to a discussion on the climatic, bath, and physical therapy of heart disease. Thorne[31] gives an elaborate account of the adaptation of Nauheim methods to home use. They include **Baths** and **Exercises.** In the former he begins with 4 oz. calcium chloride and 5 lb. sodium chloride to the bath, increasing the strength gradually. The bath temperature is 98° F. to begin with, being lowered by degrees (e.g. 1° every other bath) to 92°—not lower in Britain, except in summer weather. Each bath lasts four minutes at first, increasing up to twenty. Halfway through the course of twenty-five baths, carbonic acid tablets are added to increase the stimulation of the skin, on which the efficacy of the method depends. The baths must be given by a trained nurse; the patient must be freed from all business worries during the course, and must lie in bed for an hour after each bath. The exercises aim at dilatation of the intramuscular vessels, and, like the baths, have in view a relief of the heart's work by diminution of peripheral resistance. They consist of systematized movements of the body and limbs against gentle gradual resistance applied by the medical man or a skilled attendant. Thorne claims that these methods benefit myocardial inadequacy of all kinds, whether primary, or secondary to increased arterial tension, valvular fibrosis, etc.; and that they are effective in reduction of high blood-pressure.

Schoonmaker[32] defines Nauheim treatment as practised in America. It includes baths and exercises, applied in ways similar to Thorne's; to which are added **Massage, Incandescent Sweating Baths,** and **Auto-Condensation,** if the patients can stand them. The indications which he gives are practically the same as Thorne's; if the lesion is one which is capable of relief by lowering of peripheral resistance, and the heart is still fit to respond, then the Nauheim methods are likely to do good. Of **Diet** he says that light meals are best; food requiring mastication is preferable to "slops," as it causes less flatulence, and sometimes, if œdema be present, the total fluid intake must be greatly restricted in

the presence of stasis (œdema of lower limbs, etc.) and continuous dyspnœa. **Rest in Bed** is indicated, with two or three days' starvation diet before cardiac tonics are used. **Digitalis** should then be given in full doses, till congestive symptoms are relieved.

Groedel,[33] writing from Nauheim, claims that the treatment given there by means of **Carbon-Dioxide Baths** exercises a beneficial effect on lesions of auriculo-ventricular conductivity ; and that in one case of total heart-block of three-and-a-half years' duration the normal sequence was restored by the baths, at least for the time, when all other treatment had failed.

In spite of all these laudatory remarks, however, the impartial clinician will probably feel that Bishop[34] is nearer the truth when he ascribes much of the benefit derived from a visit to Nauheim to the psychical effect. As he points out, the visitor to the German spa is influenced not only by the baths (which are given on two or three consecutive days, then interrupted by a rest-day), but by the careful cooking and the quiet outdoor recreations which are provided. The air of the place is sleepy and restful, there is a spirit of optimism abroad (the failures are kept out of sight), and everyone is on holiday. No drugs are given, and even the coffee is innocent of caffein.

The value of **Cane Sugar** in the treatment of myocardial weakness, brought forward by Goulston last year, is again referred to by him in a new paper,[35] also by Carter[36] and Dingle.[37] Goulston finds West Indian cane sugar superior to other varieties, and thinks this may be due to its containing an enzyme or some other special constituent. Carter's patient, a lady of sixty-two with old-standing myocardial degeneration aggravated by an influenzal attack, took Glebe granulated sugar in quantities increasing from 2 to 4 oz. daily, for over a month, falling again gradually to 2 oz., which amount has been maintained since ; with very marked improvement in the symptoms and signs. Dingle's patient had been tapped twice for cardiac ascites when he began to take 5 oz. of sugar daily. Since then he has been much better, needing no further paracentesis and scarcely any drugs.

That the value of **Digitalis** and its congeners is especially manifested in the treatment of total arrhythmia (*see* AURICULAR FIBRILLATION), is now generally accepted. What is not so certain is its usefulness in other conditions. In speaking of the treatment of chronic myocardial disease, G. A. Gibson[38] says he finds small doses of digitalis (up to 10 drops daily) with **Nux Vomica,** useful in the milder cases ; for graver ones larger doses are necessary. Cushing[39] also considers it indicated in all forms of myocardial exhaustion ; pre-eminently, however, in auricular fibrillation. Mayor[40] indeed claims that small doses given to patients with adequately compensated cardiac lesions, in periods with intervals diminishing till the course becomes continuous, will serve to prevent breakdown.

Nobécourt[41] notes that **Digitalin** can be given to children, and that it is particularly beneficial in cases of cardiac breakdown. He uses a

solution, one drop of which contains $\frac{1}{50}$ mgram, and gives 1 or 2 drops daily till 10 drops have been given; if this fails to relieve, persistence is useless. Price's[42] systematic observations of the blood-pressure in patients with cardiac disease receiving full doses of digitalin, show that it is not raised; and that there is therefore no need to fear that its administration will increase the heart's burden by raising the peripheral resistance. (For other observations regarding digitalis and digalen, *see pages* 11, 12.)

Voigt[43] has found **Suprarenal Extract** and **Adrenalin** of use in the relief of cardiac dyspnœa and dropsy. The dose used was $2\frac{1}{2}$ to 5 gr. of the former, and 5 to 15 min. of a ·1 per cent solution of the latter.

Weile[44] speaks highly of the combination of **Ergotin** with **Caffein,** given either hypodermically or in tablet form by the mouth, in chronic myocarditis, arteriosclerosis, and in cardiac neuroses. The precise indications are not stated, but it is said to be an effective substitute for digitalis where this has failed to give relief.

Roch[45] has tested **Adonis Vernalis** as a cardiac tonic, but finds it disappointing. Its action is feeble unless given in doses which the digestive tract refuses to tolerate.

Weiss[46] reports on the use of **Adalin** in cardiac cases. Given in doses of 5 to $7\frac{1}{2}$ gr. it has a safe though rather brief hypnotic action, and it is tasteless.

G. A. Gibson,[47] in outlining the treatment of *non-valvular disease of the heart,* says that **Rest** is the best of all cardiac tonics; it must be accompanied by abundance of fresh air and a sufficiency of sleep. During the period of rest, **Massage, Passive Movements,** and **Baths** are also useful. For tachycardia or palpitation, he recommends **Calcium Bromide.** If chemical poisons, such as tobacco or alcohol, are responsible for the cardiac lesion, these must be forbidden; in such cases he uses **Strychnine** with **Hydrobromic Acid.** Similarly, gouty patients require **Colchicum** and **Alkalies.** Often the symptoms of cardiac dilatation encountered at the climacteric are relieved by **Thyroid Extract.**

The discussion on *early cardiac rheumatism* at the British Medical Association meeting at Liverpool, introduced by Lees,[48] discovered a general agreement among the speakers as to the value of **Rest** and **Salicylates.** The introducer advocates very large doses of the latter, guarding the patient from poisoning by means of adequate purgation and combination of sodium bicarbonate with the salicylic salt. Poynton expressed scepticism as to the curative value of salicylates, thinking their usefulness confined to relief of symptoms. Probably the truth lies between the two extremes.

Rosin[49] says that in treating *cardiac asthma,* rapidity of action is of urgent importance; drugs must be injected rather than given by mouth. Injections of **Camphor** in a 10 per cent oily solution are invaluable; as they are non-toxic they may be repeated every fifteen minutes. He also uses **Caffein** in a 2 per cent solution, kept sterile by addition of phenol; three injections within the hour can be borne. If

all else fails, he recommends an intramuscular injection of **Epinephrin.** Heat or cold may be applied to the præcordium; while **Reflex Stimulation** by bathing the extremities in very hot water, or applying mustard to the præcordium, may be useful. **Venesection,** with withdrawal of not less than 200 c.c., may give rapid relief. Finally, he mentions **Oxygen** as having some value. Barber[4] found **Morphine,** given subcutaneously, and usually with **Atropine,** of more use than anything else.

Rich[50] succeeded in stopping a paroxysm of tachycardia in a young lady by the following manœuvre, best described in his own words: "I seated myself in front of the patient. Putting my right hand flat over her heart, and my left on her back directly opposite, I directed her to take a deep breath, close her glottis, and fix strongly the walls of her chest. I then squeezed the chest-walls with some force, attempting to exert some pressure on the upper part of the heart. Instantly she expressed relief, and, grasping her wrist, I found the pulse to be 110, whereas fifteen seconds previously it had been 220. After resting a few minutes, she went home perfectly relieved."

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HEART, WOUNDS OF.

H. Hartmann, M.D., Paris.

During the past fifteen years there has been a steady improvement in the surgical treatment of wounds of the heart. Pool,[1] describing a case of knife-wound on which he operated successfully, collected 77 other records published since 1909, when Peck wrote a monograph dealing with 159 reported cases.

Although spontaneous healing of cardiac wounds may occur, as is proved by the autopsy made six months after the accident, and reported by Gross and Heully,[2] Pool considers that surgery is indicated whenever there is definite or even presumptive evidence that the heart is wounded. Operation must be undertaken without delay, as to allow hæmorrhage and shock to continue increases the danger. Since the pleura is opened in nearly all cases, either primarily or during

the course of the operation, the use of differential-pressure apparatus (either diminishing the external or raising the intrapulmonary pressure) is to be approved of; but since these differences of pressure may increase hæmorrhage, it is well to employ them only when the cardiac bleeding is controlled.

The most rapid method of approach, and that which involves least hæmorrhage, consists of longitudinal incision of the fourth interspace and possible separation of the ribs, with section of the costal cartilages near the sternum if necessary. Flap operations should be practised only if the general state is good, plenty of time is at disposal, pneumothorax is not present, and if no differential-pressure apparatus is available.

The heart being exposed, the wound should be sutured with fine silk and a curved needle, the intestinal stitch being used. Drainage of pericardium and pleura is indicated only when there is special reason to fear sepsis.

To Pool's records may be added two other successful cases of suture (Guichoff and Nedelkoff,[3] Mossop[4]), and two others apparently followed by cerebral embolism (Chastenet de Giry[5]). Hesse,[6] studying the records of cardiac suture from the point of view of end-results, finds them satisfactory. Untoward results are due to cardio-pericardial adhesions; to avoid which, it is best to forego drainage of the pericardium and to suture it completely.

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HEAT PROSTRATION. *Herbert French, M.D., F.R.C.P.*

The very severe heat-wave in Boston, in July, 1911, enabled W. D. Bird[1] to study the symptoms and the effects of treatment in 158 cases of heat prostration. His conclusions differ in some respects from the usual text-book teaching. A study of the cases shows that they fall into three distinct types, which he designates as (1) *Heat exhaustion;* (2) *Heat prostration*; and (3) *Heat stroke.* Pathologically the three classes may not be so definite, but from the bedside and therapeutic standpoints this grouping would seem to be almost unavoidable.

1. *Heat Exhaustion.*—These patients commonly present a moist, cool skin, with subnormal temperature, occasionally as low as 95° or 96°. The pulse is small and rapid, and the patient is very pale and prostrated, not rarely unconscious. The patient has usually been subjected to long-continued high temperature, not necessarily in the sun, combined with physical exertion. There were ten patients and three deaths. Seven of these patients were between thirty and fifty years of age, nine were brunettes, and six of the seven survivors were discharged by the third day.

TREATMENT.—**Dry Rub,** blankets, sometimes heaters, **Ice Bag** to the head, and **Stimulation** according to the individual case. Whisky,

aromatic spirits of ammonia, caffeine, and strychnine, and occasionally adrenalin were used. Bird suggests that in this type **Adrenalin** seems the stimulant whose physiological action is just what is needed.

2. *Heat Prostration.*—These cases comprised the largest number in the series and with the lowest mortality record. The patients had temperatures varying from normal to 102° or even 103°. Many felt dizzy, nauseated, and complained of headache. A few lost consciousness, the coma being very similar to that of simple syncope and lasting for a short time only, while all felt much prostrated. Many of these patients had a normal temperature, while of those with fever the skin retained moisture and there was an absence of cyanosis or lividity. The circulatory condition of this type was generally good, only moderate stimulation being used on thirty out of the eighty-seven patients. There was one death. This was a woman of seventy-eight years, who died six days later of hypostatic pneumonia. Seventy-one of these were brunettes, and mostly over twenty years of age. About two-thirds were discharged in three days.

TREATMENT.—**Ice Cap, Ice Pack, Cold Pack,** or **Sponge Bath,** according to the temperature, and rest in bed with moderate stimulation as above if there were signs of weakness.

3. *Heat Stroke.*—This is by far the most serious and impressive of the three. There were sixty-one of these cases, with a mortality of thirty-eight. The patients were generally unconscious, livid and often cyanotic, with a hot dry skin and temperatures ranging from about 104° to 110° + (many axillary temperatures registering at 110°). The more serious of these cases were breathing stertorously, frothing at the mouth, and some vomited large quantities of dark semi-fluid material, almost fæcal in character. This type all showed venous engorgement, with visible carotid pulsations in the sides of the neck, and a full bounding pulse, except in the moribund cases, where the heart was giving out. The pupils were generally small, often pinpoint, and not reacting to light, knee-jerks were frequently absent, and a large majority showed considerable muscular rigidity.

The following is a summary of all the cases in this group :—

	Cases	Deaths
Total ..	61 with	38
Male	57 ,,	37
Female	4 ,,	1
Temperature		
–105°	10 ,,	1
105°–106°	8 ,,	4
106°–107°	8 ,,	5
107°–108°	6 ,,	6
108°–109°	14 ,,	10
109°–110° + ..	15 ,,	12

Complications on entrance :	Cases	Deaths
Alcohol	14 with	11
Failing heart ..	15 ,,	9
Œdema of lungs ..	32 ,,	28
Convulsions	28 ,,	20
Complications later :		
Delirium tremens ..	11 ,,	10
Persistent coma ..	15 ,,	15
Pneumonia	5 ,,	5
Rise of temperature	4 ,,	3

Alcohol was probably a larger factor than this table shows, but in only fourteen cases was there positive evidence of its use.

The deaths numbered : under 1 hour, 6 ; under 4 hours, 7 ; under 12 hours, 8 ; under 24 hours, 4 ; under 2 days, 5 ; over 2 days, 8.

Eliminating the six cases who died in less than one hour after entrance, some of whom were dead in five minutes, we have fifty-five cases with a mortality of thirty-two, or 58 per cent.

TREATMENT.—Here there are four indications: (1) Reduction of temperature; (2) Maintenance of cardiac action; (3) Control of convulsions; (4) Treatment of complications.

1. **Tub Baths** and **Ice Packs** were the choice in combating the high temperature. If the heart action was poor, the ice pack was always used, to avoid moving the patient. Vigorous **Friction** seemed essential to good results. Also not a few cases were observed where too long continuance caused too great a reduction of temperature and a condition of collapse was induced. **Ice-Water Enemata** were used in a few instances, but as a rule a proper use of external measures seemed sufficient.

2. Maintenance of cardiac action often required **Stimulation** of a heroic type, mostly hypodermically, as the patients were generally unconscious. Generous use of **Atropine** was practised for pulmonary œdema, and **Strychnine, Camphor,** and various forms of shock **Enemata** were directed at the failing heart. It was the general opinion among the house staff that the use of camphor, 2 gr. in sterile oil by syringe, was of distinct value.

3. Convulsions were so frequent in the heat-stroke cases that it became the practice towards the end of the so-called epidemic to administer **Morphia** subcutaneously, and sometimes **Hyoscine,** with the plan of repeating the morphia if the convulsions nevertheless developed.

4. The treatment of complications as they occurred varied in no way from that which would be adopted in cases in which they were the primary disease. About five of the unconscious men required catheterization for retention of urine.

I. Chandler Walker[2] also records his experiences of a large number of heat-prostration cases in the Boston heat wave of 1911. He draws particular attention to the fact that prostration by heat-stroke is by no means necessarily the result of direct exposure to the sun; a great many of his cases had not been in the sun at all. He claims that his figures show that when the person who is stricken down by heat prostration has been drinking beer or spirits shortly before, there is less tendency for the temperature to go to an extreme height than is the case in those who have not been drinking. Two-thirds of those patients who had a low or normal temperature had been taking alcohol in some form; whereas of patients having a temperature over 105° F., only one-fifth had been drinking alcohol in any form.

REFERENCES.—[1]*Bost. Med. and Surg. Jour.* 1911, 643; [2]*Ibid.* 1911, 648.

HEMIANOPIA. (*See* VISUAL DEFECTS.)

HEPATITIS, AMŒBIC.

(*Vol.* 1912, *p.* 236; see also AMŒBIASIS)—It is agreed by many observers of wide experience that **Ipecacuanha** is the drug which does most good in these cases.

HEPATOPTOSIS. *Sir B. G. A. Moynihan, M.S., F.R.C.S.*
H. Upcott, F.R.C.S.

Werelius[1] has collected 67 cases of hepatoptosis treated by operation, and adds one of his own. In this case the liver was secured

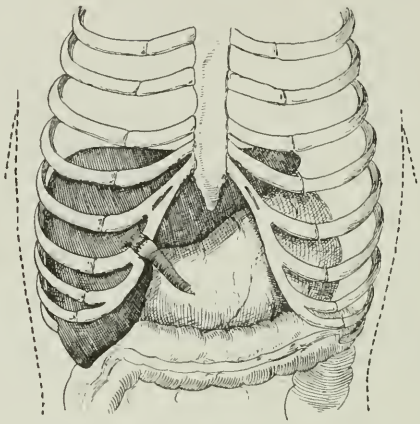


Fig. 77.—Hepatoptosis.

in position by suturing the round ligament over the ninth costal cartilage (*Fig.* 77). The result six months later was very good.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 510.

HERNIA. *Sir B. G. A. Moynihan, M.S., F.R.C.S.*
H. Upcott, F.R.C.S.

Roughton[1] believes that all oblique inguinal hernial sacs in children and young adults are developmental in origin and are never really "acquired"; and further, that if a person has a hernia on one side, there is a possibility or even a probability that a sac is present on the opposite side. He has recently made a practice of exploring the opposite inguinal canal when operating for hernia, and has found such a latent sac in ten out of eighteen cases, varying in length from half an inch to two or three inches.

Telford[2] has also made it a practice when operating for unilateral hernia, to explore the opposite inguinal canal in all cases in which the external ring has seemed unduly large. He does not remember a single case where he has failed to find a small potential sac there.

The "saccular" theory of hernia is now so widely accepted that it is interesting to hear a statement from the other side. Keith[3] believes that the presence of a sac is not the most important factor in the development of hernia. As regards inguinal hernia, there is undoubtedly a congenital diverticulum, the upper part of which—the funicular process—gradually closes and disappears. In four out of

every ten infants under four months of age it is still patent, and one in every fifty adults may show its opening in the abdomen. The case is quite different with femoral hernia. In no stage of development is there a process or diverticulum in this region. Femoral hernia is rare under the age of twenty-one. On the other hand, peritoneal diverticula in the femoral region are extremely common in adults, especially in elderly people. These facts go to show that femoral diverticula are formed by a condition or force which comes into action in adult years.

Keith found by experiment that the intra-abdominal pressure rose to 100 mm. Hg. when an average man stooped down and lifted a fifty-six pound weight. He also found that the peritoneum at the groin, if unsupported, as at the crural rings, could be forced outward under such pressure. That the presence of a congenital diverticulum is not the essential cause of hernia is suggested by the fact that man is almost the only mammal in which the funicular process is obliterated, and yet he is the only one liable to hernia. Keith believes that the cause of inguinal hernia must be sought in a derangement of the muscular mechanism of the groin.

It is often necessary to operate for abdominal conditions upon patients who also have herniæ, either femoral, inguinal, or umbilical. According to Beckman,[4] it has been the practice in the Mayo clinic to repair these herniæ from within the abdomen, provided they are not too large. In the case of femoral hernia, after the primary operation has been completed, the abdominal wall is retracted on the side of the hernia so that the femoral ring is exposed. A pair of artery forceps is then introduced through the hernial ring from within the abdomen to the bottom of the sac. The sac is grasped with these forceps and pulled back into the abdomen. Two or three mattress sutures of heavy linen or silk are then passed completely through the neck of the sac and tied. The remaining portion of the sac can then be either excised or stitched to the abdominal wall. In the cure of inguinal herniæ by this method only those of small size are suitable, those in which the entire sac can be pulled back into the abdomen and the pillars of the internal ring sutured with linen.

Moschcowitz[5] says that *hernia of the ovary* occurs most frequently during infancy—when the ovary has an extrapelvic position—and during the child-bearing age, when it becomes lifted out of the pelvis during pregnancy. Acute symptoms in ovarian hernia during infancy are generally due to torsion of the pedicle. The local signs of strangulation, with absence of symptoms of intestinal obstruction, will indicate the diagnosis.

Pirie records a case in which the presence of a hernial sac was discovered by *x*-ray examination (*page* 53)

REFERENCES.—[1]*Lancet*, 1912, i, 1534; [2]*Med. Chron.* 1912, Apr.; [3]*Med. Press and Circ.* 1911, ii, 495; [4]*Ann. Surg*, 1912, Apr. 570; [5]*N. Y. Med. Jour.* 1912, i, 693.

HERPES ZOSTER. *E. Graham Little, M.D., F.R.C.P.*

The association of the eruption of herpes zoster with a well-established visceral disease is a rare and exceedingly interesting event, and the case recorded by Krotoszyner[1] afforded an opportunity of demonstrating the existence of pyonephrotic destruction of the left kidney with an attack of herpes zoster in Head's areas on the skin corresponding to the segmental innervation of the kidney.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 900.

HYDATIDS, PULMONARY. (*See* LUNG, SURGERY OF.)

HYDROCELE.

(*Vol.* 1912, *p.* 331)—As an alternative to excision, the insertion of **Sterile Catgut** into the sac may be used by way of inducing its obliteration.

HYPERIDROSIS. *E. Graham Little, M.D., F.R.C.P.*

Meachen[1] has some useful remarks on the treatment of this condition. For sweating feet the following dusting powder should be used (after preliminary washing of the feet with warm 1 per cent solution of **Potassium Permanganate**) :—

R	Pot. Permang.	℥ij	Zinci Carb.	
	Pulv. Alumin.	gr. xx	Zinci Oxidi	āā ℥ss
	Talci Pulv.	℥j		

White stockings, soaked in saturated **Boric Acid** lotion may be used, when the powder is objected to. If there is fœtor, **Lysoform** lotion (from ½ to 5 per cent) may be used, to be followed by a dusting powder of **Tannoform.** For the hands, the following lotion is advised :—

R	Tannin	℥j	Spt. Vini Rect.	℥vj
	Eau de Cologne	℥ij	Aq.	ad ℥viij

Or this :—

R	Quin. Sulph.	℥j	Aq. Rosæ.	ad ℥viij
	Spt. Vin. Rect.	℥vj		

For sweating of the axillæ, if of mild degree, they may be bathed in weak **Vinegar,** and dusted with the following powder :—

R	Acid. Salicyl	gr. xx	Pulv. Aluminis	ad ℥is
	Pulv. Amyli.	℥ij		

or this lotion :—

R	β-naphthol	℥j	Spt. Vin. Rect.	ad ℥iiss
	Glycerini	℥ij		

In resistant cases half a pastille dose of **X-rays** may be given, and repeated after ten days.

REFERENCES.—[1]*Pract.* 1911, ii, 589.

HYPERNEPHROMA. (*See* ADDISON'S DISEASE.)

HYPERTRICHOSIS. *E. Graham Little, M.D., F.R.C.P.*

Baum[1] gives some novel and useful directions for the small operation of **Electrolysis** of superfluous hair. The current he employs is smaller than that usually advised, and is from $\frac{1}{3}$ to 1 milliampère ; it must be accurately measured. Before the operation, and at intervals during the epilation, the skin is macerated with absolute alcohol. The whitening of the skin round the needle point is the best criterion of sufficient treatment. The needle should be introduced into the follicle, removed when the whitening occurs, the hair removed with forceps, and the needle again introduced deeply to destroy the papillæ. The Leclanché cell is the best source of the current. The author considers hypertrichosis to be caused by toxæmias. Overworked spinster school teachers are the type of patient mostly met with. Indicanuria is a common association.

Dubreuilh[2] likewise recommends a weak current—1 to $1\frac{1}{2}$ milliampères—used for an average of five to twenty seconds (the latter for the largest hairs). He uses a very small needle-holder, 3 cm. long, and an olive-point needle made of the hair-spring of a watch, with an elbow 6 mm. from the point.

The advantages and drawbacks of *x*-ray treatment are discussed on *page* 59.

References.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 104 ; [2]*Presse Méd.* 1912, 775.

ILEUS, POST-OPERATIVE.

Pituitrin has been successfully used (*page* 33).

INFANT FEEDING. *Frederick Langmead, M.D., M.R.C.P.*

Breast Feeding.

No one who has had to deal with large numbers of infants in hospitals or elsewhere will disagree with Wile,[1] who deplores the readiness with which infants are taken from the breast. Much of the real good which milk stations have done to reduce infant mortality has been discounted by the wholesale way in which is supplied an artificial substitute for breast milk, which purports to be of equal value, and is obtained readily. An effort to secure an adequate supply of breast milk is not made with the same frequency as formerly, because of a misplaced feeling of confidence in various methods of artificial feeding.

If the breast milk rapidly lessens during the first weeks of the puerperium, it is commonly thought that artificial feeding is essential because the breast milk will soon cease to flow altogether. If the breasts are not used for feeding for a few days, it is often believed that they soon become inert, and that any attempt to stimulate them to new activity is doomed to failure. Wile says that this is not so, but that maternal nursing may be re-established, even though several months have elapsed since the breasts were used. The best method

of creating a maternal milk-supply is to secure a traction on the nipple by the nursing infant. If the baby be put to the breast systematically and regularly, the breast milk will usually increase gradually. While this increasing supply is being engendered, supplemental or mixed feeding is of great value, and in many cases may be gradually reduced, until the baby thrives on the milk of the breasts alone.

With proper treatment of the breasts, abscesses should be rare, but after they have occurred, and having been incised and drained, have healed, there is no reason for not permitting them to resume their normal function. If for any reason, such as local ulceration or cracked nipples, it is essential that suckling should not take place, the activity of the gland may be retained if the mother gently expresses as much milk as possible every three hours. The same may be done if, owing to fatigue, the milk is inadequate. The rest from breast-feeding which the mother obtains in this way will often be followed by a sufficient supply of milk when the baby is again nursed.

In the case of puny infants, it is very desirable, when possible, that the nipples be sucked by a stronger infant, or the breast will become less active, and before the weak child is able to draw on the nipples with efficient force, the milk will have ceased to flow. An illustration of the extent to which the function of the breasts may be exalted, is afforded by the experience of Budin, who fed forty weak children from the breasts of fourteen wet-nurses. At times he was able to secure a daily milk-supply of 2,840 grams from one woman.

Hand-Feeding.

The whole subject of artificial feeding is still very involved. Although cow's milk, in some form, is generally regarded as the most satisfactory substitute for breast milk, its shortcomings are so far recognized that fresh modifications are being constantly tried, with varying degrees of success. In the British Isles, the method still most accepted is **Simple Dilution,** cream and sugar being subsequently added to raise the fat and carbohydrate content to that of human milk.

The advantages of **Whole Milk** are obvious, since when no dilution is made, no cream or sugar need be added, and manipulation is reduced to a minimum. Although it had been occasionally seen that babies fed on whole milk could digest it and thrive, it was not used at all frequently until Budin was able to testify to its value in no uncertain manner, and now it is widely used, especially in France and Germany. He however advocates a *sterilized whole milk,* kept at 100° C. for fifteen minutes, a procedure which probably renders it more digestible. A simpler method is that of adding 2 gr. of **Citrate of Soda** to the ounce of milk, thereby rendering its curd soft and flocculent like that of human milk, and avoiding the chief cause of digestive disturbance. The writer, and more recently H. C. Mann[2] and others, have published statistics showing the good results which accrue from feeding by citrated whole milk, results which entitle it to a more extended use in

future. Poynton, to whom the profession is indebted for first proving the value of citration, prefers to combine citration with dilution, but uses only 1 gr. of sodium citrate to the ounce of milk.

Since Czerny showed that the curds in the motions of hand-fed infants consist largely of saponified and neutral fat and fatty acids, much attention has been directed to the *fat* of cow's milk, which has been blamed as the most important cause of the digestive disorders of infancy. Darling[3] points out that in the coagulation of milk, the fat globules are enmeshed, very much as the red blood corpuscles are entangled in clotting blood. The more fat there is in the milk, therefore, the bulkier the curd. Contrary to former belief, it has been shown that finely emulsified fats are to a large extent split into fatty acids and glycerin by an enzyme in the stomach, and this is particularly important in infants, in whom the usual pancreatic fat-splitting ferment plays a minor part. The power of the infant to digest fats is limited, and may be disturbed in two ways if an excess of fat is given. In the first place, the fat globules become enmeshed during the curdling of the casein, so that large tough curds are formed, and the gastric enzyme is prevented mechanically from exerting its splitting action; and in the second place, the bile may not supply enough alkaline bases to complete saponification, and as a result the fats undergo abnormal fermentation which may seriously interfere with digestion. This, according to Darling, is the probable cause of much of the gas formation, abnormal acidity, sour vomiting, colic, and other symptoms which are caused by fat indigestion.

To overcome these difficulties, he recommends **Milk with Reduced Fat Content.** The plan he adopts is as follows: A quart of milk is allowed to stand until the cream is well separated; then with a cream-dipper the top six ounces are removed. The remaining milk contains approximately 1 per cent of fat. If two-thirds of the cream is restored, the milk contains about 3 per cent of fat; if one-third only is put back, the fat content of the milk becomes 2 per cent. These figures apply to milk originally containing 4 per cent of fat.

Percentage Feeding, or the method of feeding by ordering each constituent—proteid, fat, and sugar—in the form of a prescription, dispensed accordingly by the dairy, has never been in vogue in this country. Its expense and the amount of manipulation involved have been thought to outweigh any advantages it may possess. Holt[4] gives a ready method of calculating milk formulas of various percentages. The first step is to secure milks which contain different fat percentages: 7, 6, 5, 4, 3, 2, and 1 per cent of fat. This is done from a quart of milk containing 4 per cent of fat, thus: To obtain 7 per cent milk, use the upper sixteen ounces; to obtain 6 per cent, the upper twenty ounces; for 5 per cent, the upper twenty-four ounces; for 4 per cent, all; for 3 per cent, the remainder after skimming off two ounces; for 2 per cent, the remainder after skimming off four ounces; and for 1 per cent, the remainder after skimming off eight

ounces. Every ounce of 7 per cent milk in a 20-oz. mixture will add one-twentieth of 7 per cent, or ·35 per cent, of fat; every ounce of 6 per cent milk will add ·30 per cent of fat; every ounce of 5 per cent milk will add ·25 per cent of fat, etc.

Buttermilk has been used as an infant food, particularly in Holland. It appears to be of greatest value in conditions of intestinal fermentation. Neff[5] states that he has employed it in many infants who were difficult to feed, and also in cases of atrophy. His experience is that it exerts a beneficial therapeutic effect in mild entero-colitis cases, and that such cases developed less commonly among infants who had been fed on it. The buttermilk used was obtained daily by churning top milk naturally soured at the room temperature or by the addition of a small amount of the previous day's milk. On the other hand, Clock[6] thinks that buttermilk is not effective in the treatment of intestinal conditions, because it does not contain a bacillus that will survive ingestion, multiply in the intestine, and therefore produce sufficient nascent lactic acid to combat the bacilli of putrefaction. The good results that have been derived from buttermilk are due chiefly to the large amount of soluble protein furnished in a finely divided form, which can be digested easily.

Clock therefore recommends the intestinal implantation of the **Bacillus lactis Bulgaricus.** He does this in the form of tablets containing the organism in pure culture. One tablet, dissolved in a teaspoonful of water, is given after every bottle-feeding, and in some cases before also. The cases (twenty-two in number) which he treated in this way, were those of infants suffering from gastro-enteritis and entero-colitis. He claims that the gastric symptoms quickly disappeared, the toxæmia subsided, the indigestion cleared up, mucus and blood disappeared from the stools, which soon lost their foul odour, and became well formed and normal in colour usually on the third or fourth day. There was never any return of the intestinal disturbance. No other therapeutic measures were employed, and no alteration was made in the diet. These results are certainly better than one has been led to expect from other forms of treatment by the *B. lactis*.

Neff (*loc. cit.*) speaks of the value of **Skimmed Milk** for infants who have an apparent intolerance for fat. He adds enough maltose to bring the total sugar up to 7 per cent. When an infant ceases to gain with this diet, top milk may be gradually added. In his experience the best milk preparation has proved to be **Malt Soup.** According to Brady[7] it is made in the following manner: 2 oz. of wheat flour are mixed with 11 oz. of whole milk, and then passed through a sieve; in a second vessel, 3 oz. of extract of malt are mixed with 20 oz. of warm water; the two mixtures are then poured into a porcelain vessel, 2½ dr. of 11 per cent carbonate of potassium added, and the whole cooked for twenty minutes with constant stirring, and then brought to a momentary boil; any loss through heat is made up by the addition of boiled water. The mixture has a formula of: fat 1·20 per cent,

protein 2·00 per cent, carbohydrates 12·00 per cent, and is suitable for babies from the third to the ninth month. For babies under three months old, the flour is reduced to 1 oz. and the malt extract to 2 oz. [The proportion of carbohydrate appears to us to be much too high.—F. L.]

Since the introduction of **"Eiweiss Milk"** or **Albumin Milk** by Finkelstein and Meyer, it has been tried by several independent workers, not always with success. Thus Chapin administered this food to twenty infants, and had twelve deaths. Welde's experience, however, corroborates in every way the good results obtained by Finkelstein and Meyer. It is recommended for digestive disturbances and infective conditions of the bowel. It is thus prepared according to Brady[8]: One tablespoonful of essence of pepsin, or a rennet tablet, is added to a quart of milk, which is warmed to 100° F. After fifteen minutes the milk is well curdled; the whey is then poured off. The curds are placed in a muslin bag and allowed to drip two hours. They are then mashed through a hair sieve, twelve to fifteen times; at the same time one pint of boiled water is poured through the sieve. One pint of buttermilk is added, and maltose up to 7 per cent. If this does not bring about a gain of weight, particularly if the baby is over three months old, the carbohydrate is increased by 2 per cent of flour, which must first be cooked for twenty minutes with a little water. The composition of albumin milk is proteid, 3 per cent; fat, 2·5 per cent; mineral salts, 0·4 per cent; carbohydrates, lactose, 1·5 per cent plus the percentage of maltose and flour added. In marasmus, Finkelstein advises a gradual increase of the food from 10 oz. in twenty-four hours, up to 7 or 8 oz. for each 2·2 pounds of the baby's weight, but not exceeding a quart a day. In diarrhœa, he advises weak tea only for twelve to twenty-four hours, and then small amounts of albumin-milk, beginning with 2 or 3 oz. daily. Care must be taken to add sugar after four or six days. Brady (*loc. cit.*) has treated twenty cases in this way, with favourable results in seventeen. Neff (*loc. cit.*) considers that albumin-milk has a useful but limited field in catarrhal enteritis.

Lactalbumin (Albulactin), the soluble albumin of milk, is said to act as a colloid protector, preventing the formation of tough casein curds. Working on this principle, Mather Sill[9] has fed thirty infants on modified milk, to each quart of which 80 gr. of lactalbumin were added in the form of a powder. The results obtained led him to believe that the method is one of great value, especially in ill-nourished and marasmic infants.

The *vacuum bottle* is being used as a ready means of keeping infants' feeds hot, and avoiding the necessity of making up each feed separately. Tonney and Pillinger,[10] in a timely article, point out a serious danger. If the temperature of the milk falls below 115° F., extensive bacterial growth occurs. Therefore the milk should be placed in the bottle at a temperature of 150° F. It should then be stoppered and put in a warm place. At feeding-time, the stopper should be removed and the temperature taken with a thermometer. If the reading is above

115° F., the nursing-bottle may be filled, and when cooled, feeding may be proceeded with. The milk should not be used under any circumstances if below 115° F.

References.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 775; [2]*Guy's Hosp. Gaz.* 1911, xxv. 154; [3]*Boston Med. and Surg. Jour.* 1911, ii, 747; [4]*Arch. Pediatr.* 1911, 724; [5]*Jour. Amer. Med. Assoc.* 1911, ii, 2068; [6]*Ibid.* 1912, i, 2017; [7]*Ibid.* 751; [8]*Ibid.* 1911, ii, 1970; [9]*N. Y. Med. Jour.* 1912, i, 1093; [10]*Jour. Amer. Med. Assoc.* 1912, i, 1495.

INFANTILISM. *Frederick Langmead, M.D., M.R.C.P.*

In recent years it has been shown that arrested or retarded growth both of the body and the mind is connected not infrequently either with an abnormality of internal secretions, or with disease of important viscera. Among the oldest and best-known examples of this association are cretinism and the infantilism coincident with defective development of the organs of generation. Infantilism is also now known to originate through imperfect functioning of the pituitary and suprarenal glands. Thymic infantilism has been described. By the name of *pancreatic infantilism*, Byrom Bramwell has indicated a state of arrested growth connected with deficient or absent pancreatic secretion. Herter has described *intestinal infantilism*, in which defective growth is associated with distension of the bowel and the passage of large undigested stools containing much unused proteid, carbohydrate, and fat. The subjects of this disease are liable to repeated attacks of colitis. R. Miller and L. Parsons[1] have recently collected a series of eight cases of what has been called "*renal infantilism*," first described by M. Fletcher.[2] There are two forms of this condition, in one of which the kidneys show interstitial fibrosis, whilst in the other these organs are normal in structure, but diabetes insipidus is present. In some of the cases associated with renal fibrosis, the usual cardio-vascular changes have been found, but in others the heart and vessels were normal. The symptoms in either form are polyuria, polydipsia, and retarded development, all of which may date from birth or be delayed until early childhood. There is no reason to regard the fibrosis of the kidneys as syphilitic.

Treatment.— Dupuy[3] emphasizes the close inter-relationship between the various ductless glands, and advises that infantilism should be treated by a combination of internal secretions rather than by one alone. He employs **Thyroid, Pituitary,** and **Suprarenal Extract,** either mixed or on successive days. In certain cases of persistent weakness he also adds **Testicular** and **Ovarian Extracts.** The treatment should be continued for from six to eight months in most cases, and occasionally for a year, and should be preceded and assisted by rest in bed or on a couch in the open, and ample diet, especially of carbohydrates. He records twenty-two cases in which this method of treatment was successful. Miller and Parsons state that hitherto no case of *renal* infantilism has been affected by treatment.

References.—[1]*Brit. Jour. Child. Dis.* 1912, 289; [2]*Proc. Roy. Soc. Med.* (Child. Sec.), 1911, iv, 95; [3]*Rev. de Méd.* 1912, 307.

INFLUENZA.

(*Vol.* 1912, *p.* 18)—It is claimed that **Urotropin** given in doses of 15 gr. four times in the twenty-four hours relieves both coryza and general symptoms.

INSOMNIA. *Purves Stewart, M.D., F.R.C.P.*

Treatment.—**Adalin,** a bromine derivative (bromodiethyl-acetyl-carbamide), has, within the past year or two, had a sufficiently wide trial to justify its inclusion in the list of reliable hypnotics. The usual dose is from 0·75 to 1 gram (gr. 11 to 15) administered in hot water an hour before bedtime. Walter[1] employed it in 60 cases of insomnia, in patients afflicted with various maladies, including exophthalmic goitre, cardiac neuroses, asthma, arteriosclerosis, chronic alcoholism, neurasthenia, cerebrospinal syphilis, etc. The results were highly satisfactory; sleep was promptly obtained, lasting as a rule from eight to ten hours, and as a rule without disagreeable sequelæ. In only 3 cases was there headache or dullness on the next day. The drug does not seem to produce tolerance, in fact, after prolonged administration its effective dose may sometimes be reduced to 0·5 gram. In one patient, who was specially sensitive to bromide, an acne eruption was produced. Asthmatic paroxysms were also allayed by the drug. No effect was observed on the normal blood-pressure as a rule, save an occasional fall in cases of arterio-sclerosis. It is not cumulative, and is rapidly eliminated from the body.

Fischer[2] expresses an equally satisfactory opinion, and records two cases when attempts at suicide by means of adalin-poisoning were made, the patients taking from 4 to 9 grams in all, yet beyond profound sleep of from twelve to thirty hours, no further symptoms were produced. Buttermilch[3] and Berich[4] also recommend adalin in nervous and mental cases as a safe and usually reliable hypnotic.

Other new hypnotics are **Aleudrin** (*page* 4), **Aponal** (*page* 5), **Codeonal** (*page* 9), **Luminal** (*page* 21), **Opon** (*page* 29), **Urethane** (*page* 44).

References.—[1]*Wien. klin. Woch.* 1912, No. 12; [2]*Neurol. Centralbl.* 1912, 1264; [3]*Allegem. Central-Zeitung*, 1912, 20; [4]*Lyon Méd.* 1911, Sept. 10.

INTESTINAL SURGERY. (*See also* Pericolic Membranes.)

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Intestinal Obstruction.—According to Rutherford Morison,[1] the *diagnosis* rests on a trinity of signs: spasmodic pain, inability to pass flatus, and evidence of increased peristalsis. These symptoms and signs indicate immediate operation. So soon as physicians teach that every patient with more than ordinary abdominal pain must be at once removed to a properly equipped hospital for observation and treatment, the mortality from abdominal emergencies will drop more than 50 per cent. In operating for acute obstruction, it is of great importance to keep the distended intestines within the abdomen. If the obstruction is due to growth in the large bowel, which may be

removable, Morison prefers to do a cæcostomy and then proceed with the radical operation at a later date.

In these cases of acute obstruction when the patient's abdomen is distended, Paul[2] agrees that the simplest form of relief is the most likely to be successful. His choice in such cases is a right lumbar colotomy. A colotomy which is intended to be permanent should, however, be left iliac. In the performance of the latter, he opens the bowel at once and sutures its edges to the skin (*Figs. 78, 79*).

The most generally accepted theory of the *cause of death* in acute intestinal obstruction, is that of auto-intoxication. The results of previous experimenters being rather contradictory, Murphy and Vincent[3] undertook a further series of experiments to determine

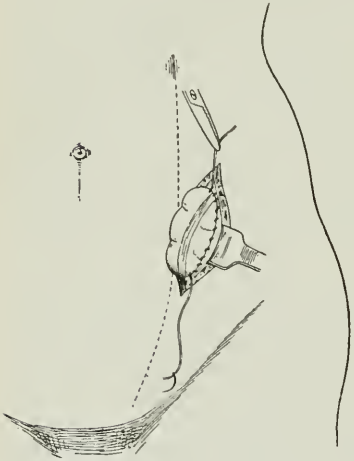


Fig. 78.—Colotomy. Deep suture.

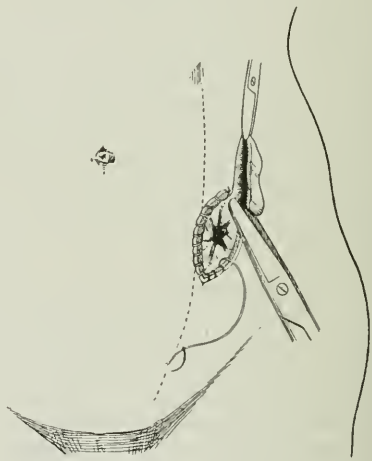


Fig. 79.—Colotomy. Superficial hæmostatic suture.

whether the substances responsible for the symptoms are the result of microbic activity, or are derived from the secretions of the intestines. They conclude that the toxic substances are purely bacterial in origin, and that the living bacteria, with their endotoxins, are directly responsible for the profound symptoms and death following intestinal obstruction.

Enterectomy.—Waugh[4] records a successful enterectomy under spinal anæsthesia for acute obstruction in an infant twenty-four hours old. The obstruction was due to a congenital hernia of the cord (*Fig.* 80); a sac the size of the child's head, with a narrow pedicle at the umbilicus, contained several coils of small intestine adhering by a short Meckel's diverticulum to the apex of the sac. Under spinal analgesia the sac was opened, and about six inches of intestine were resected, the ends being joined by lateral anastomosis. After enlarging the neck of the sac, the intestine was reduced into the abdomen and

the wound closed. The child made a satisfactory immediate recovery, but died one month later from marasmus.

Ten feet eight inches of ileum have been removed by Whitall[5] on account of a tear of the mesentery during curettage of the uterus. The patient made a good recovery and showed no signs of malnutrition. He points out that the amount which may be removed depends, among other things, upon its location. The outlook is more serious in resections of the proximal than of the distal part of the small intestine. Experiments on dogs (Flint[6]) show that 50 per cent of the small gut may be resected without causing death, and that they gradually recover their normal weight, provided they are kept on a careful diet. It is difficult to estimate the proportion of bowel that may be removed in man, as the total length of intestine varies within fairly wide limits.

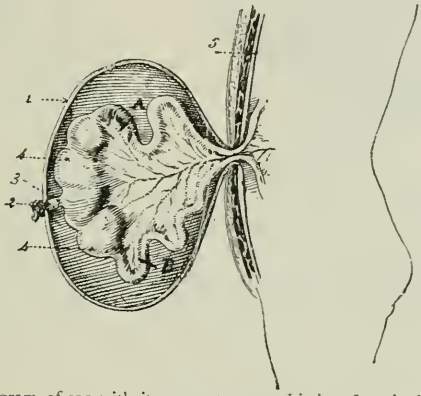


Fig. 80.—Diagram of sac with its contents. A B, Limits of excised portion of small intestine. 1. Thick-walled opalescent sac. 2. Stump of cord ligated at birth. 3. Meckel's diverticulum. 4. Sacculated portion of small intestine. 5. Parietal peritoneum.

Carcinoma of the Jejunum.—Three recent cases, recently under the care of Moynihan, have been reported by Tatlow.[7] In the first case a length of jejunum, including the tumour, was resected, and the continuity of the bowel restored by lateral anastomosis. In the second case the growth involved the duodeno-jejunal flexure, and required a difficult dissection for its removal. The ends of the intestine were united to form a Y anastomosis with the stomach. Both cases recovered. The third patient had a tumour of the lower part of the jejunum, involving several adjacent loops of bowel. Removal was impossible, so the obstruction was short-circuited by anastomosing the intestines above and below. The patient was in very poor condition, and died five days later. The symptoms in all three cases were very similar: impaired digestion; loss of appetite, weight, and colour; and increasing constipation, accompanied by colic more or less severe in character.

Repair without Resection.—A useful method of treating a limited tear, gangrene, or other injury of the intestine is described by Angus.[8]

This method has the advantage over resection that it can be performed with greater rapidity, and is therefore specially useful in emergency work when the patient's condition is grave. In the cases which he reports the operative kinking did not cause any obstructive symptoms. The method is clearly illustrated in the diagrams (*Figs.* 81, 82).

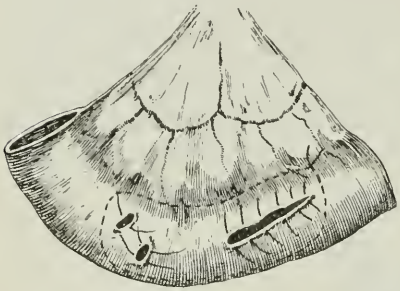


Fig. 81.

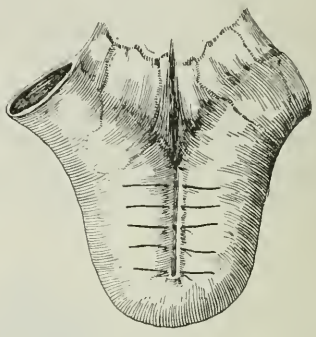


Fig. 82.—End view of anastomosis.

Colectomy.—Paul[2] advises that this operation, if for growth, be done in three stages (any obstruction having been previously relieved by a right lumbar colotomy). The first stage consists in isolating the loop of bowel bearing the growth, which is brought outside the abdomen. The two limbs of the loop are sutured together side by side, and the wound closed around them (*Figs.* 83, 84). The affected portion of

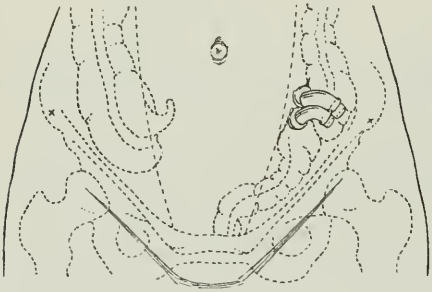


Fig. 83.

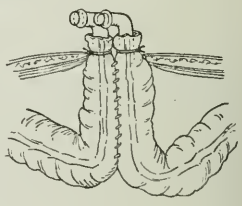


Fig. 84.

COLECTOMY.

bowel is then cut away, and glass drainage tubes (Paul's) fixed in the ends. Three or four weeks later the spur is destroyed by means of a strong clamp. Closure of the fistula constitutes the third stage.

Paul emphasizes the necessity for a knowledge of the different types of carcinoma of the large bowel, for in no other part of the body is there a greater variation in its degrees of malignancy. The most malignant is the colloid type; next to this comes the scirrhous type of annular carcinoma, while the soft fungating cancer is the least

malignant. A knowledge of these facts will influence the choice of operation.

The *use of a segment of small intestine for bridging the gap* left after

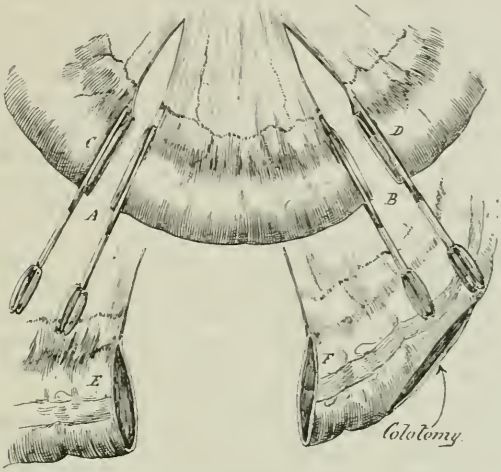


Fig. 85.—Growth removed from sigmoid, segment of lower ileum isolated.

excision of a carcinoma of the sigmoid is described by Fenwick[3] (*Figs.* 85, 86). A preliminary iliac colotomy had been performed for relief of obstruction. After resecting the portion of sigmoid containing

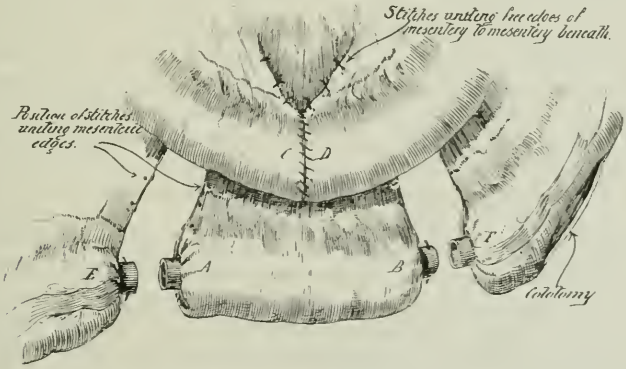


Fig. 86.—Small intestine (lower ileum) reunited in front of freed segment by two layers of sutures, Murphy's buttons in position in the large and the freed segment of small bowel. For the sake of clearness, the mesentery of the segment of small gut has been drawn longer than it should have been.

the growth at a later operation, it was found impossible to unite the cut ends. A segment of small intestine was therefore isolated (without detaching it from its mesentery) and transplanted so as to restore

the continuity of the colon. The patient recovered, and the colotomy was subsequently closed, though a small fistula remained at the time of the report.

A similar operation has been reported by Faltin.[10] His patient had suffered for many years from a severe colitis. Finally the signs of acute obstruction developed. On opening the abdomen it was found that the left half of the transverse colon, the descending colon, and part of the sigmoid were gangrenous. The whole of the gangrenous segment was resected, and the two ends of the bowel were brought out into the wound. The continuity of the intestine was later on restored by isolating a segment of ileum, implanting its upper end into the side of the transverse colon, and anastomosing its lower end to the stump of the sigmoid.

Ileo-cæcal Tuberculosis.—Barker[11] says the first question to be decided as to treatment is whether to do the operation in one or two stages. If the ileum is distended, livid, and œdematous—in other words, if there is evidence of marked obstruction—the operation should be limited to fixing a loop of bowel in the wound, to be subsequently opened and drained through a Paul's tube.

If the ileum is merely hypertrophied, as is usual in these cases, it should be anastomosed to the colon well beyond the disease. If the surgeon has no intention of doing more than a short circuiting, a lateral anastomosis is the simplest, as there are no blind ends to be sutured. If, however, he means to proceed at once to the removal of the diseased bowel, it is better to cut across the ileum and implant the proximal end into the side of the transverse colon. At the conclusion of the anastomosis it must be decided whether the patient's condition will allow of a radical operation. If his strength will permit, it is better to complete this at once. The peritoneal reflection on the outer side of the ascending colon is divided, and the bowel, with the posterior peritoneum containing its blood and lymph supply, is stripped up towards the mid-line. The right colic artery is secured near its origin, the middle colic after it has given off its left colic branch. The colon is divided proximal to the anastomosis, and the distal stump closed. The affected segment of bowel is removed, and the abdominal wall sutured.

Intestinal Stasis.—According to Barrington Ward,[12] constipation with intestinal stasis is by no means uncommon in children, and is specially evident in those suffering from tuberculous disease of the joints ; not, of course, in all such cases, but in a considerable proportion of those with rapidly advancing tuberculous disease, or in long-standing cases which are going down hill.

Symptoms.—The principal symptoms of intestinal stasis are a dirty yellow-brown staining of the skin, most marked in the flexures ; a poor circulation, as shown by cold clammy extremities ; the child is listless, dull, miserable, and poorly nourished. The diagnosis is confirmed by radiographic evidence of delay in the passage of fæces through the large bowel (*see page* 53).

TREATMENT.—Twelve cases of intestinal stasis in children with tuberculous joints were operated upon by Lane; the large bowel being short-circuited by means of ileo-colostomy. The affected joints were simply treated by fixation in splints. One patient died as a result of intestinal strangulation through the gap in the mesentery. Of the 11 who recovered, the stasis was completely cured in 10, and the local joint condition was greatly benefited, in some being entirely cured. In one case the stasis was not relieved by operation, but since the adoption of measures to ensure a daily emptying of the rectum, the patient has made rapid strides.

Failure of the Colon to Rotate.—This should, according to Mayo,[13] be suspected if the cæcum is not found in its normal position. If the duodenum is found to be movable, merging directly into the jejunum and not covered by the transverse colon, a positive diagnosis of non-rotation of the colon may be made, and the cæcum sought for in the left iliac fossa. Mayo records five cases in which this condition was found. It should be remembered as a possible explanation of occasional puzzling symptoms.

Sigmoiditis in a Hernial Sac.—Patel[14] records a case due to suppuration of a fatty appendage. The symptoms were those of a strangulated hernia, though the redness and œdema of the sac pointed to some septic complication. At operation, the sac was found to contain a quantity of offensive pus and a loop of the sigmoid. The bowel was not strangulated, but covered with lymph, and one of the appendices epiploicæ was gangrenous.

Acquired Diverticula of the Large Bowel.—These are not uncommonly found at autopsy in elderly persons. The majority, according to Mayo,[15] give rise to no symptoms during life, but it is now being recognized that a certain number of cases having the clinical aspect of cancer of the large bowel may be examples of intestinal diverticula associated with peridiverticulitis. The inflammatory mass resulting from infection through a diverticulum may so closely resemble a malignant tumour that diagnosis is impossible even at operation.

It must also be remembered that the chronic irritation of one of these pouches may be an etiological factor in the development of malignant disease. Among 27 cases seen by the Mayos, there occurred seven in which carcinoma was grafted on diverticulitis.

REFERENCES.—[1]*Edin. Med. Jour.* 1912, ii, 197; [2]*Lancet*, 1912, ii, 217; [3]*Boston Med. and Surg. Jour.* 1911, ii, 584; [4]*Lancet*, 1912, i, 427; [5]*Ann. Surg.* 1911, ii, 559; [6]*Johns Hop. Hosp. Bull.* 1912, 128; [7]*Lancet*, 1912, i, 991; [8]*Brit. Med. Jour.* 1912, i, 119; [9]*Ibid.* 1911, ii, 781; [10]*Deut. Zeits. f. Chir.* 1912, 215; [11]*Lancet*, 1911, ii, 871; [12]*Pract.* 1912, i, 570; [13]*Med. Rec.* 1912, ii, 401; [14]*Rev. de Méd.* 1911, ii, 564; [15]*Jour. Amer. Med. Assoc.* 1912, i, 250.

IRITIS.

(*Vol.* 1912, *pp.* 281, 283)—In the syphilitic, form injections of **Salvarsan** have proved rapidly curative in some but not all cases. In localized tuberculosis of the iris injection of **Tuberculin** is indicated.

JAUNDICE.

Herbert French, M.D., F.R.C.P.

The occurrence of jaundice in *epidemic* form, especially amongst children, has been recorded from time to time, and a recent instance of this kind was observed by W. J. H. Pinniger.[1] His cases, eight in number, occurred in an institution where some 2,000 children, of ages varying from a few months up to sixteen years, are cared for. These children all live under identically similar conditions as regards food, clothing, habits of life, and so on, but they are divided amongst five houses, which are practically independent of one another. All the cases occurred in one only of these houses. Moreover, the house in which the outbreak took place contains two departments, a girls' and an infants', the latter consisting of girls under nine. These two departments, though not absolutely separate, mix very little. The cases were confined to this infants' department, the only patient of more than nine years of age being a girl of sixteen, who helped in looking after the smaller children.

There was nothing remarkable about the disease. It consisted of an attack of obstructive jaundice (that is, tingeing of the skin, conjunctiva, and urine, and absence of bile from the stools), a variable degree of fever, some feeling of malaise, and in three cases enlargement of the liver, without, however, any tenderness. In two of the cases jaundice was not present to the full extent—that is, there was no change in the colour of the urine and stools. There was no history of antecedent gastro-intestinal trouble. The cases as soon as they occurred were removed from the department to the infirmary, where, with the usual treatment, they soon recovered. They were discharged when all trace of jaundice had disappeared and they were quite well in themselves. The interesting point about the series is that the fact of its being limited to one department only—no other cases occurred in the rest of the institution all through the summer—suggests that the disease was probably infectious. Bacteriological investigations and serum tests in cases of this kind would probably lead to valuable discoveries and throw light upon the nature of the infection.

A similar epidemic is recorded by W. B. Holderness,[2] who was called to see a pupil at a ladies' school of fifty boarders who had been very sick during the previous night. She was not isolated; two other pupils slept in the same room, and three days afterwards they became ill, one with similar vomiting, the other with nausea and malaise. On the following day in an adjoining room another girl fell ill, and on the fifth day in another part of the house two became ill, and on another floor one, all within a week. The youngest girl attacked was 11, the oldest 15 years of age. All these patients developed jaundice, the staining of the conjunctiva, dark urine, and clay-coloured stools appearing about the third to the fifth day of the illness. No apparent cause for the epidemic could be found, and the patients all recovered without any complication.

Jaundice has long been familiar as a symptom of *cirrhosis of the liver*; it may occur early or late, and may be slight or severe; how

the jaundice is brought about in these cases, however, has never been clearly shown. The fæces are often of normal colour notwithstanding the jaundice, so that obstruction to the larger bile-ducts is generally not present, but one has felt in a vague way that perhaps catarrh in the smaller ducts, secondary to the inflammatory changes in the portal canals, might be sufficient to account for it. A much more likely explanation, however, is that propounded by J. Chalier,[3] who brings forward evidence to show that the jaundice occurring in association with alcoholic cirrhosis of the liver is due to hæmolytic agents in the blood-stream. The degree of hæmolysis is variable, but sometimes attains an intensity sufficient to produce a jaundice comparable to icterus gravis. He estimates the resisting power of the red corpuscles by immersing them in graduated strengths of salt solution and finding the most dilute saline in which they are not laked. This line of investigation, when it has been worked at further, may possibly afford a useful measure of the prognosis in cases of cirrhosis.

References.—[1]*Brit. Med. Jour.* 1911, ii, 1353; [2]*Ibid.* 1911, ii, 1533; [3]*Rev. de Méd.* 1911, Oct. 171.

JOINTS, INJURIES OF. (*See* Fractures.)

JOINTS, SURGERY OF. *Priestley Leech, M.D., F.R.C.S.*

Arthrodesis and Arthrolysis.—Lorenz's[1] views on this subject are worth consideration by surgical enthusiasts. The only intention of **Arthrodesis** is to free the patient from his orthopædic apparatus; without this result the operation is a failure. Fibrous ankylosis interferes considerably with the endurance of function, the fibrous tissue not being able to stand the wear and tear of function under the weight of the body. Fibrous ankylosed joints easily become tired and even painful, and are not exempt from subsequent contractures. To prevent pain and contracture, patients with such joints are bound to wear apparatus; they have lost the only advantage of the operation to get rid of the brace, and at the same time are afflicted with the great disadvantages of arthrodesis—the loss of mobility of the joint. Even in a paralyzed joint this loss has to be judged on its merits. Is a normally pliable, otherwise healthy and durable joint, even in a paralyzed limb, preferable to a bony ankylosed joint? Lorenz thinks it is.

In the *hip*, the only indication for arthrodesis is bilateral paralysis, and even then only on the more severely affected side. His opinion is the same as regards the *knee*, and in any case operation should be deferred until adult life. In the *ankle*, where a stiff joint does not interfere with sitting, he thinks the endurance of function is diminished even by a good result.

As regards the joints of the upper limb, he thinks arthrodesis may be good; except in the *elbow*, where a very simple brace, allowing nothing but the extended and flexed positions of the joint, gives a more useful arm than a stiff elbow in rectangular flexion. Arthrodesis of the paralyzed *shoulder* deserves commendation; the operation should be

delayed to adolescence. In the *wrist*, arthrodesis seldom comes into question. In cases where the extensors of the fingers are affected and a contraction of the wrist joint in ulnar flexion is present, arthrodesis of the wrist joint is of great value ; not only to correct deformity, but also to get the advantage of transplantation of the dorsal flexors of the wrist to the paralyzed palmar flexor muscles of the fingers.

Arthrolysis can only procure a movable joint. It does not necessarily mean a stable joint ; if it produces one lacking endurance, sensitive and liable to become painful, then the operation has been a failure. Even an ankylosed joint in good position is preferable to a mobile but sensitive or painful joint lacking stability or endurance. At present, the indications for operative mobilization of a joint depend in the first place upon the ankylosing process.

If *tuberculosis* has been the cause of ankylosis, especially in the static joints, and if these are stiffened in a good position, Lorenz says it is nothing but a crime to try to mobilize them ; the tuberculous process may become acute again. *Osteomyelitic* ankylosis is equally liable to recrudescence after the rather severe mobilizing operation. *Rheumatic ankylosis*, or ankylosis after metastatic or traumatic suppuration, seems less dangerous in this respect. Very important conditions are youth, general health, strength, resistance, energy, tolerance of pain, and determination on the part of the patient to assist the surgeon's orders—conditions which may only seldom be found united.

More frequently perhaps, these conditions may occur combined in cases of *gonorrhœal ankylosis*. In addition to all these circumstances, the condition of the muscular power plays a great part in the indication of operative mobilization. The best substance for securing the necessary separation of the resected articular surfaces is a muscular or fascial flap taken from the immediate neighbourhood of the joint.

In ankylosis of the *hip*, if in good position, the patient walks well, without limp, and the only discomfort is in sitting. Of all stiff joints the ankylosed hip is the least cumbersome to the patient, since the mobile joint of the other side works for its fellow. In addition, mobilization of the hip is dangerous, and Lorenz thinks that in unilateral ankylosis it is not justified. In bilateral ankylosis, unilateral arthrolysis is justifiable, but not necessary in all cases. In Lorenz's operation on the hip, the neck of the femur is divided as nearly as possible to the head of the bone ; then the raw surface of the femur is turned aside and upwards by rotating the thigh outward and pushing it upwards. A pseudo-arthrosis pelvitrochanterica forms in time.

In the case of the *knee*, all attempts to get a mobile and useful joint have failed, and when it is ankylosed in a good position it is better left alone. Of the joints of the upper limb, the only joint where arthrolysis is justifiable is the *elbow*. Lorenz thinks a flail elbow is preferable to a stiff one, and for ankylosis of the temporo-maxillary joint arthrolysis is indicated.

Reference.—[1]*N. Y. Med. Jour.* 1912, i, 1301.

JOINTS, TUBERCULOSIS OF. (*See* TUBERCULOSIS, SURGICAL, *and* SINUSES.)

KERATOMALACIA.

(*Vol.* 1912, *p.* 217)—The treatment of this condition, a dystrophic process occurring in marasmic infants and ending in ulceration or even necrosis of the cornea, lies chiefly in means for improvement of the general health. The eyes should be kept cleansed with warm, mild antiseptic douches, and **Eserine** (·5–1 per cent in sterile oil) dropped into the eyes twice to six times daily.

KERATOSIS, SENILE. *E. Graham Little, M.D., F.R.C.P.*

As this condition frequently becomes transformed into epithelioma, interference with it should be effectively obstructive, or it is not to be recommended. Montgomery and Culver[1] strongly recommend the application of **Trichloracetic Acid.** Crusts having been removed, a saturated solution of the crystals in water is applied with a swab, and well rubbed into the spot treated for a few moments, after which the effect is to be stopped by washing freely with water. The surface should show white when cauterization is sufficient, and the action must not be prolonged beyond this point.

REFERENCE.—[1]*Jour. Cut. Dis.* 1912, 523.

KIDNEY, SURGERY OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Lebmann[1] discusses at length the indications for **Decapsulation of the Kidney,** and forms the following conclusions. The Edebohls method is based on false views, which are not supported in practice and should be cast aside. Nevertheless, renal decapsulation has a value of its own, and is followed by an improvement in the general health in chronic nephritis. The nephritic process itself is not, at any rate permanently, influenced. Decapsulation is indicated in the so-called renal neuralgias and in angioneurotic hæmorrhages. It is directly life-saving in cases of profound oliguria or anuria, and especially in uræmia occurring in the course of acute nephritis. In this disease the resolution of the inflammation is favourably influenced. In uræmia complicating chronic nephritis, the operation is only justified when there is an acute exacerbation of a chronic nephritis and the kidneys are not totally inefficient. In suppurative nephritis, decapsulation should be combined with drainage of the renal pelvis if it is not necessary to perform nephrotomy. The effect in all these cases results from diminution of tension of the kidney and an improvement of the circulation which follows.

After reviewing at length the literature on decapsulation of the kidney, de Bovis[2] concludes as follows: "The impression gained is not favourable to decapsulation. Thus, one cannot state that it is injurious, but it is almost certain that it does not exercise any decisive influence. From the point of view of the results obtained in puerperal eclampsia, there is little to be said. True, a free action of the kidneys is an important point and one which should be arrived at by every possible means, but there is no doubt that at the critical moment the state of the kidneys plays only a secondary

rôle. If it becomes again a perfectly secreting filter it does not succeed in preventing hepatic necrosis, petechial hæmorrhages, or encephalitis. Should we give up decapsulation of the kidneys in eclampsia? Perhaps, but it is also possible that in some cases of eclampsia the renal lesions exceed the other alterations in the body. Applied to such, decapsulation may not be useless, and this may explain certain extraordinary successes too numerous to be mere coincidence."

Paschkis[3] discusses the question of *exploration of both kidneys in tuberculosis* as a preliminary to nephrectomy if one only is found diseased. In cases where tuberculosis has been diagnosed, the question always arises whether only one or both kidneys are diseased; and if only one, which is the affected organ? Cystoscopy, catheterization of the ureters, and separation, are the methods which almost always settle these questions. On the other hand, these methods fail in cases where the bladder is contracted and ulceration of the entire surface of the mucous membrane prevents intravesical investigations. Since Rovsing suggested exploration of both kidneys by the lumbar extraperitoneal route in such cases, a number of surgeons have used this method.

The author states that according to his experience, the unilateral cases where both kidneys were exposed could not, so far as the success of the operation was concerned, be differentiated from those in which only one side was operated on. The supposed healthy kidney is first exposed, inspected, palpated, decapsulated, and the ureter inspected. The author does not approve of nephrotomy of the kidney, as it is a much graver proceeding, and holds that the above method is sufficient. If the kidney appears healthy, he proceeds to remove the other.

[No explanation is given of the reason for decapsulation of the kidney, which appears to be superfluous. Exploration by nephotomy adds greatly to the certainty with which an early lesion of the pyramids can be discovered, although it is not of course an infallible method. This operation and the subsequent nephrectomy can be done at an interval of some weeks.—J. W. T. W.]

Nephrectomy is the subject of a study based on the records of 112 cases by Gerster.[4] The usual oblique lumbar incision was used, and the twelfth intercostal nerve and artery were avoided. When the fatty capsule of the kidney is exposed, the peritoneal reflection should be defined, as it may require to be incised, or even if not, accidental wounds which may be overlooked in a septic case are avoided. The relation of the kidney to the hepatic flexure of the colon rarely causes trouble, but frequently the left kidney is closely adherent to the splenic flexure of the colon. When the kidney is situated high under the ribs, a vertical subsidiary incision is added to the oblique, running in the scapular line upward across one, two, or even three ribs.

"Subperiosteal resection of the rib or ribs having liberated the costal border, the pleural sinus became thus mobilized and was readily drawn upward out of the way." Should injury of the pleura occur,

it is not of great importance, and its significance has been much exaggerated. Pressure with a pledget of moist gauze will stop leakage of air, and a suture will secure the rent at the end of the operation. This observer has never seen serious consequences follow limited pleural injury, and in one case, where a considerable area of the adherent pleura had to be taken away with the rigid sac of an echinococcus cyst, the momentary collapse of the lung was overcome by plugging and artificial respiration.

Accidental arterial hæmorrhage during the progress of nephrectomy occurred once, and venous hæmorrhage twice. The author recommends that the vein should be tied and divided first, and then the artery, as the opposite procedure is apt to put too much tension on the delicate walls of the vein, which may be torn.

In tuberculosis and malignant neoplasms, the fatty capsule should be removed with the diseased kidney. When the tumour is of moderate size this can be accomplished with little difficulty, but when the process is chronic and there are abscesses in the cortex, it may be difficult or impossible. In old-standing pyonephrosis with dense adhesions, subcapsular nephrectomy should be adopted. There is a massive pedicle formed by the fatty capsule, the vessels, the pelvis, and sometimes the ureter. Around this, and as high up as possible, he places an elastic ligature consisting of a solid rubber cord, $\frac{1}{6}$ in., and 12 in. long. The assistant holds the kidney, and the surgeon stretches the elastic cord and crosses the ends close to the pedicle. Another assistant passes a short stout silk ligature under the point of crossing; this is firmly tied, and the tension on the ends of the cord released. The pedicle is cut through at a safe distance from the elastic ligature. The ends of the rubber cord and of the silk ligature are brought out through the angle of the wound, which is left open. The rubber ligature comes away in twelve to thirty-six days, according to the thickness of the pedicle.

Nephrectomy was performed for pyonephrosis in sixty-one cases, with a mortality of 14·75 per cent (primary nephrectomy, 10 per cent; secondary nephrectomy, 19·35 per cent). The author considers that the result in some cases would have been better had a primary nephrectomy been done, but in others the condition of the patient was too precarious for anything but nephrotomy.

In tuberculosis, the mortality of nephrectomy was 20 per cent (primary nephrectomy, 23·5 per cent; secondary nephrectomy, three cases, no mortality). Ureterectomy was performed seven times. Nephrectomy in two cases of echinococcus cyst was successful in both, and one case of polycystic disease survived operation. In ten cases of hydronephrosis, three died. In eighteen cases of new growth the mortality was 44·4 per cent.

It is a common experience, as W. J. Mayo[5] states, to find that a lumbar incision does not give adequate exposure of a kidney pedicle. The twelfth rib is the chief obstacle. In 203 lumbar incisions it was found necessary to cut the twelfth rib in 51 cases, and in 13 of these the

pleura was accidentally opened. In not a single case did the lung collapse, or any harm result to the patient from opening the pleura. The opening was immediately sutured.

The operations were all made with the patient lying nearly flat on the abdomen with a moderate elevation of the loins, and in this position apparently collapse of the lung does not occur. In a number of cases it was observed that as soon as the muscular and fibrous attachments, especially the quadratus lumborum and lateral arcuate ligament which binds the twelfth rib to the transverse process of the first lumbar vertebra, were divided, the necessity for rib division disappeared. The upper margin of the incision including the twelfth rib was so mobilized that exposure of the kidney, and especially of the kidney pedicle, was quickly accomplished. The pleura was easily pushed upwards and not opened.

The author makes the following modification of the usual lumbar incision (*Plate XVII*). Beginning at a point 2 to 2½ in. lateral to the dorsal spines, near the outer margin of the erector spinæ, the incision lies behind the twelfth rib from the angle, if present, nearly to the head, and reaches downward to a point ½ in. below the angle. From this point the incision passes obliquely downward and forward along the anterior margin of the quadratus lumborum to a point 1 in. above the crest of the ilium, and thence turning more forward parallel to the iliac crest, as far as necessary. The posterior half of the twelfth rib is exposed and cleared above and behind the angle, and the pleura pushed upward.

McKelvey Bell[6] described an operation for *movable kidney*, in some respects resembling that introduced by Vulliet. The lumbar fascia is exposed by a vertical incision, and incised 1 in. from its spinous attachment. The perirenal fat is excised except at the inferior pole of the kidney, and two sutures are placed in either pole. A longitudinal bridge of capsule is raised on the convex border. A strip of the transversalis fascia, corresponding in width to the length of the elevated portion of the capsule, is now cut and passed as a strap beneath it, and sutured with chromicized catgut to the corresponding portion of the spinal attachment of the fascia. The kidney is suspended by a strap of fascia, and this is reinforced by passing the sutures through the quadratus lumborum in the usual manner and tying them over the muscle. The patient is confined to bed for three weeks.

References.—[1]*Beyl. klin. Woch.* 1912, 158; [2]*Sem. Méd.* 1912, 3; [3]*Münch. med. Woch.* 1911, 2381; [4]*Ann. Surg.* 1912, ii, 1; [5]*Ibid.* 03; [6]*N.Y. Med. Jour.* 1912, i, 112.

KIDNEY, TUBERCULOSIS OF. (*See* Tuberculosis, Renal.)

LABOUR. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Dystocia due to Shortness of the Cord.—Briggs[1] publishes a case in which the Cæsarean section had to be performed after the patient had been in labour fifty-two hours. The child was born alive. The author mentions the difficulty in diagnosis in these cases.

W. J. MAYO'S METHOD FOR EXPOSURE OF THE KIDNEY THROUGH A LUMBAR INCISION

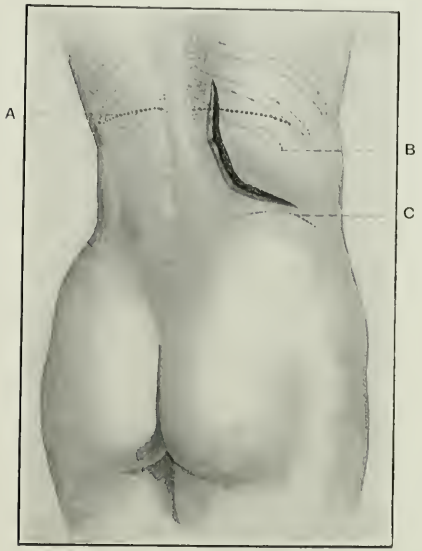


Fig. A.—Lumbar Incision.
A, Line of reflection of pleura. B, Twelfth rib. C, Crest of ilium.

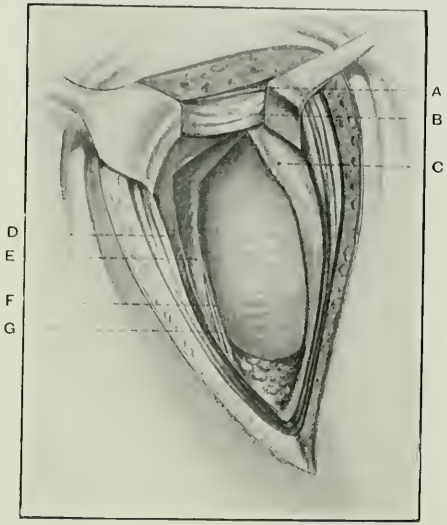


Fig. B.—Kidney Exposed.
A, Lumbo-dorsal fascia, posterior layer. B, Erector spinæ muscle. C, Twelfth rib. D, Lumbo-dorsal fascia. E, Quadratus lumborum muscle. F, The hypogastric nerve. G, The ilio-inguinal nerve.

Adapted from "Annals of Surgery"

Uterine Contraction Ring.—Willett[2] and Williamson[3] each record a case in which difficulty was experienced in delivering the shoulders owing to a definite ring of contracting muscle, above and below which the uterus was soft.

The treatment carried out by Willett after delivering the head of the dead fœtus with forceps, consisted in applying continuous traction by a weight over a pulley at the end of the bed (estimated at 8 lb.). The patient slept for three hours and then awoke, and with a few slight pains the child was rapidly delivered. Williamson applied forceps under deep anæsthesia, and pulled steadily for fifteen minutes, when the ring appeared to yield and the child came through. On subsequent examination an incomplete rupture of the uterus was found, extending into the broad ligament on the right side. This had to be sewn up.

Labour in Tabes Dorsalis.—Jakub[4] reports a case in which labour passed off normally, except that there was complete absence of sensation on the patient's part. The uterus could be palpated in contraction, but no pains were felt. The placenta followed in a few minutes, and the puerperium was normal.

Rupture of Uterus.—Blacker[5] gives the results of eight cases of rupture of the uterus. Five were treated conservatively, four of them dying; while of the three later cases treated by operation, all recovered. The value of the different methods of treatment are discussed at length, and it is shown by statistics from various clinics and from clinical experience that the correct treatment for all cases of complete rupture of the uterus is **Laparotomy,** followed by **Hysterectomy** if necessary. The abdominal section offers the only sure means of hæmostasis and of efficient drainage of the peritoneal cavity.

Pubiotomy.—Lamond Lackie[6] publishes three cases of pubiotomy performed by the subcutaneous method, and resulting favourably for both mothers and children. The latest figures of German authorities, dealing with a large series, show a maternal mortality of 4·4 per cent and a fœtal mortality of 6 per cent. Comparison should be made with the results of induction for small contractions, in which pubiotomy is an alternative measure, when it is seen that the maternal mortality is only 1·5 per cent and the fœtal mortality ascends to 35 per cent.

Asphyxia of the New-born.—Champneys,[7] in an introductory address to a discussion on this subject, reviewed the methods of treatment, which may be summed up as follows: (1) Ensuring the patency of the air-passages, with absence of mucus; (2) Excitation of the circulation; and (3) Ventilation of the lungs. These are best performed by **Wiping out the Mouth and Pharynx,** by the application of the **Hot Bath,** with either Sylvester's or Schultze's method of **Artificial Respiration.** In blue asphyxia, the urgency of treatment is not great, as many recover if left; but in white asphyxia, energetic measures must be taken after a careful diagnosis of the condition. In prognosis, a slow heart-beat is of more serious significance than a rapid or weak one.

Fœtal Death.—Williamson[8] encountered a case in which the fœtus bled to death from rupture of an umbilical artery and thrombosis of a branch of the umbilical vein, when the insertion of the cord was velamentous. The literature of the subject contains information concerning twelve cases; in four, the bleeding was from the vein, and in the remainder from rupture of an artery. The condition is frequently associated with vasa prævia, in which case it is advised that when a diagnosis has been established, the vessel should be cut between two ligatures and the delivery of the child hastened, or the membranes may be artificially ruptured as far as possible from the region of the vessel, but for this the passages must be sufficiently dilated. The chances of saving the child's life depend on diagnosing the position of the vessel, and as this may be well to one side of the os and still give rise to hæmorrhage from rupture, or asphyxia from pressure, the difficulty is considerable.

The oxytocic action of **Pituitrin** is fully discussed on *page* 31; *see also* **Berberine** (*page* 6), and **Tyramine** (*page* 43).

References.—[1]*Jour. Obst. & Gyn.*, 1912, i, 225; [2]*Ibid.* 1912, i, 339; [3]*Ibid.* 1912, i, 342; [4]*Zentralb. f. Gyn.* 1911, No. 3; [5]*Lancet*, 1912, i, 84; [6]*Edin. Med. Jour.* 1912, July; [7]*Brit. Med. Jour.* 1911, ii, 978; [8]*Jour. Obst. & Gyn.* 1912, i, 203.

LABYRINTHITIS, SYPHILITIC.

(*Vol.* 1912, *p.* 47)—It is claimed that labyrinthine disease arising early in the syphilitic process is amenable to treatment by **Salvarsan**: but that the later forms react less readily.

LARYNGOSCOPY, BRONCHOSCOPY, AND GASTROSCOPY.

Chevalier Jackson, M.D., Pittsburg.

Laryngoscopy, Direct.

The larynx of any infant or older child can be examined with ease and certainty, without pain, and without anæsthesia, general or local. Yet, strange to say, the determination of the cause of a croupy cough in infants and children is attempted, a diagnosis is made, and treatment is instituted, in almost all cases, by deduction and not by inspection. Children are given antitoxin for papilloma, laryngeal spasm, foreign bodies, influenzal laryngotracheitis, and other conditions, rather than wait for a necessarily very late deductive clinical diagnosis. This deplorable state of affairs is inexcusable, for it is now eighteen years since Kirstein demonstrated that the larynx can be inspected *directly*, i.e., in contradistinction to the older and well-known method of *indirect* inspection by means of a laryngoscopic mirror. Kirstein's demonstration lay dead until Killian's improved instruments and methods rendered the procedure easy (to the trained); but strange to say, after all these years, the method which permits of certainty in the determination of the cause of any case of croupy cough in children is relatively rarely used.

A number of excellent articles upon instruments and technique have appeared during the year; but as the procedure, though

readily learned under a competent teacher, is one that cannot be acquired by reading, save by long and patient practice and a degree of natural aptitude, it would be useless to review the purely technical articles. Those already taught will find exceedingly interesting the discussion of the subject by von Eicken, St. Clair Thomson, Paterson, Hill, and others.[1]

One point not clearly brought out there or elsewhere, to the writer's knowledge, is that while direct laryngoscopy for diagnosis is a procedure easily learned, and is, moreover, an accomplishment essential to the modern general practitioner outside of large medical centres, bronchoscopy and œsophagoscopy are extremely technical and dangerous procedures, save in the hands of a few men of special aptitude and training. Moreover, almost all cases of the latter class can easily be transported to the large medical centres where special skill is available. Direct laryngoscopy for all purposes other than diagnosis, such as the removal of foreign bodies and neoplasms, the local treatment of tuberculous and other diseases, also comes under the head of extremely technical procedures. Indirect laryngoscopy by the old mirror method will never be superseded by the new direct method for general diagnostic purposes, except in children. To see into an infant's larynx with a mirror is impossible, except under general anæsthesia, while by the new indirect method, it is painless and needs no anæsthesia, general or local. After skill is acquired, it is a safe procedure except in extremely dyspnœic cases, where the life of the patient may depend upon the promptness with which the examiner can insert a bronchoscope. Direct laryngoscopy has proved of aid in a number of procedures. One of the most important of these is for the placing of tubes for tracheal insufflation anæsthesia, as demonstrated with great success by Charles A. Elsberg.[2]

Bronchoscopy.

Primarily, bronchoscopy was devised by Killian for the removal of foreign bodies from the lower air-passages. Its use in this class of cases demonstrated the relatively harmless character of bronchoscopy in skilful hands, and revealed endoscopic pictures of disease of the lower air-passages; and now comes bronchoscopic aid in both diagnosis and therapeutics. Gaub[3] demonstrates the possibilities of bronchoscopic aid in thoracotomy. Oxygen is passed down the bronchoscope, and the lung is inflated or deflated, at the command of the surgeon, by the bronchoscopist, who has introduced his bronchoscope through the mouth (*Fig.* 87). Freudenthal[1] follows up the work of Nowotny, Ephraim, and Horn, and he has been able to obtain beneficial effects from the local endoscopic treatment of *asthma*, using **Adrenalin** 1–1000, sprayed into the bronchi with an atomizer passed through the bronchoscope. The method obviously will be reserved for the most serious cases, and its exact limitations have not as yet been

determined. Cocaine has been similarly used, but drug habit must be guarded against. Mayer[5] reports an interesting case of the bronchoscopic diagnosis, and removal from the left main bronchial orifice, of a benign growth which had been the cause of a severe expiratory dyspnœa.

Bronchoscopy is now in use for the removal of foreign bodies from the trachea and bronchi in all the large medical centres. The early writers (the abstracter among the number) made the serious error of stating that bronchoscopy is easy. In an able article, Tilley[6] sums up the matter thus: "While it would be idle affectation to suggest that neither skill nor practice is necessary for the intelligent use of the bronchoscope in dealing with a serious and not uncommon accident—viz., the inhalation or swallowing of a foreign body—yet, it is very true that a little practice, combined with patience and gentleness, should render any surgeon competent to use the bronchoscope with reasonable assurance."

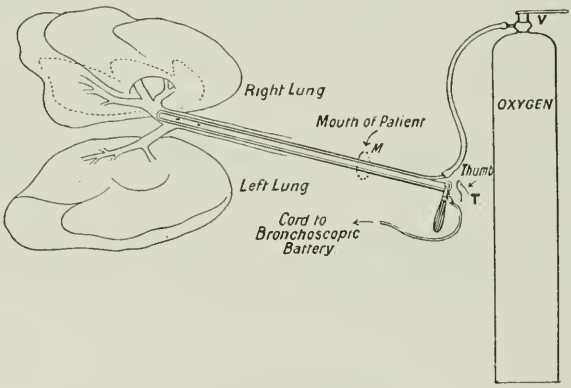


Fig. 87.—Schematic illustration of bronchoscopic aid in thoracotomy.

Improvements in instruments and technique have been chiefly in minor details. In technique, perhaps the most marked advance has been in the tardy realization of a point forcibly made six years ago by an American pioneer in bronchoscopy, namely, that every detail of aseptic technique must be strictly followed. This will limit the infective risks to those organisms already present in the mucosa, to which the patient is more or less immune. If this be not done, sooner or later the operator will have upon his conscience the burden of having inoculated a fellow-creature with syphilis, diphtheria, erysipelas, tuberculosis, or other infection.

Serious infective accidents have been reported recently, proving the danger of careless aseptic technique. The best method of oral antisepsis is by thorough cleansing of the teeth and mouth with a tooth-brush, followed by rinsing and gargling with a 30 per cent watery solution of alcohol.

Anæsthesia is much less used by the skilful than formerly, especially in children. The need for anæsthesia, general or local, is in inverse ratio to the skill. When required, the interruptions incident to instrumentation through the tube are obviated by the use of the attachment suggested by Dr. T. Drysdale Buchanan, by which the chloroform or ether vapour is blown in through a side inlet in the bronchoscope by means of a Krohne and Sesemann dosimetric apparatus (*Fig.* 88). Instruments have been devised to meet special problems in the safe removal of foreign bodies of peculiar nature requiring new devices.

E. Fletcher Ingals[7] urges care in the after-treatment of patients from whose lower air-passages foreign bodies have been removed. Undoubtedly, serious neglect of this is quite general. He advises

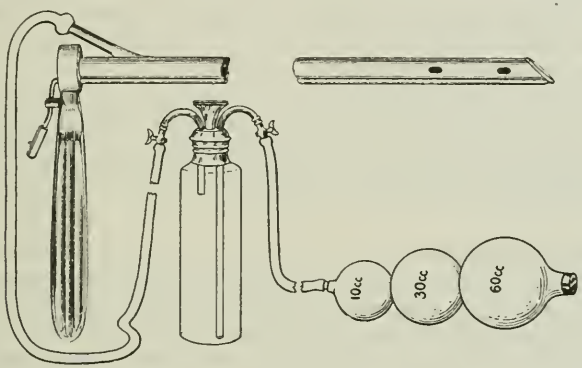


Fig. 88.—Dosimetric anæsthetizing attachment for the bronchoscope, devised by Dr. T. Drysdale Buchanan, using the Krohne and Sesemann apparatus.

placing the patient in a **Croup Tent,** and administers **Salines, Diaphoretics,** and **Diuretics,** to minimize the dangers of œdema, bronchitis, and bronchopneumonia, due to the traumatism and infection by the foreign body.

Gastroscopy.

Gastroscopy is steadily progressing, and its technique is being developed. It is not probable that every practitioner will ever do his own gastroscopy, any more than he now does his own radiography, histologic microscopy, cystoscopy, or ophthalmoscopy. The method affords the greatest promise in the diagnosis of obscure cases of stomach disease, and especially in the early diagnosis of gastric cancer while yet operable. Janeway and Green[8] state: "A palpable tumour usually exists when the disease is first recognized; and this condition is rather a reproach to medicine." These authors report fourteen cases of gastroscopy, in eleven of which they were able to make a diagnosis; one case of ulcer, and ten of carcinoma. In two cases carcinoma existed, but

was not discovered at gastroscopy, indicating that, as in many other diagnostic methods, positive findings are valuable, but negative results are less so. Very accurate coloured illustrations of gastroscopic appearances are given.

William Hill,[9] in an excellent monograph, describes a very successful gastroscope with open tube, lens system, and distal light. E. J. Moure[10] describes a modification of the Loening and Stieda gastroscope, with which gastroscopy is a quite practical procedure. Hans Elsner,[11] in a comprehensive and beautifully illustrated monograph, describes a gastroscope with which much excellent work has been done.

These and many other workers have developed gastroscopy to the point where an early diagnosis of gastric cancer is possible, and where all the certainty of ocular inspection is available in obscure cases of gastric disease. Hill very aptly states that "the time has come when gastroscopy can no longer be neglected by those who lay claim to be considered gastric experts."

REFERENCES.—[1]*Brit. Med. Jour.* 1910, ii, 1613; [2]*Ann. Surg.* 1911, 161; [3]*Laryng.* 1910, i, 150; [4]*N.Y. Med. Jour.* 1911, i, 1219; [5]*Jour. Amer. Med. Assoc.* 1911, ii, 392; [6]*Lancet*, 1911, i, 1066; [7]*Jour. Amer. Med. Assoc.* 1912, i, 467; [8]*Œsoph. and Gastros. Surg. Gyn. and Obst.* 1911, 245; [9]*Gastroscopy*, London, also *Brit. Med. Jour.* 1911, ii, 1074; [10]*Presse Med.* 1912, 101; [11]*Die Gastroskopie*, Leipzig.

LARYNX, DISEASES OF. *George L. Richards, M.D.*

Tuberculosis.—Wood,[1] from his experiments in cauterizing tuberculous lesions in guinea-pigs, finds that an area larger than that directly cauterized is retarded in development, the nodule healing by cicatrization, which tends to the formation of new blood-vessels and thus to nutrition of otherwise necrotic tissues. Cauterization seals the lymphatics and blood-vessels, preventing the spread of the disease through these channels either locally or generally.

Fetterolf[2] has found the combination of **Ethyl Alcohol** 75 per cent and **Cocaine** 1 per cent to relieve pain in advanced and inoperable tuberculosis. Twenty-five minims are used at a time, and the injections are made at three-day intervals. The injection is made so as to reach the internal laryngeal nerve in the thyrohyoid space.

Horn[3] finds that injection of alcohol into the perineural sheath of the superior laryngeal nerve after the manner of Hoffman, lessens pain in the later stages. He reports ten cases in which relief from single injections lasted from nine to forty-six days.

Grant[4] advises **Rest** for the larynx, and the avoidance of unnecessary coughing. He thinks **Heroin** the best remedy for the cough. Williams[5] advocates **Sanatorium Treatment,** and total abstention from the use of the voice. He finds tuberculous lesions may be arrested by **Vaccines,** whether autogenous or artificial. A bacillary emulsion is used, beginning with $\frac{1}{5000}$ gram, or P.T.O. in doses of 0·0001, gradually increasing to 1·0 c.c.; and then the continuation of the bacillary emulsion, or else P.T.O., beginning with 0·02 c.c. and gradually increasing. The

addition of 5 per cent of **Nucleinate of Soda** promotes leucocytosis, and is of advantage. He avoids febrile reaction as much as possible. **Lactic Acid** also tends to heal localized ulcerations, and in such breaches of surface submucous injections are resorted to. If the patient is in fairly good health, the epiglottis or the fibrous granulations on the vocal cords or arytenoids may be removed. The author is, however, opposed to local treatment, unless there is a definite and strong reason for interference.

Hett[6] **Removes the Epiglottis** when the disease is limited mainly or entirely to it, and when the patient is in fair condition with a normal temperature and gaining weight under sanatorium treatment. He has not found the cautery to work very well when the lesion is on the epiglottis, and when it fails to arrest the growth he punches out the arytenoid or interarytenoid swelling. Out of thirty cases in which the epiglottis was removed, twenty-four healed within a fortnight and with no injury to the voice. Well-advanced and extensive laryngeal lesions have been arrested by this operation. No patient has had any ultimate bad effect from the loss of the epiglottis, and there need be no fear that after the operation food will go to the wrong place. Tracheotomy is done only to prevent asphyxia, and is very rarely necessary, except in some cases of chronic and massive infiltrations of the larynx where the ventricular bands or subglottic growths actually obstruct the respiration.

Lockhart[7] also advocates **Epiglottidectomy** in every case of laryngeal tuberculosis, regardless of the extent of the disease, local or constitutional, when odynphagia or dysphagia exists and can be ascribed, even though only in part, to the epiglottis; and it should be performed at the earliest possible moment when there is anything beyond a sharply-circumscribed focus, if there is a chance of arresting complicating lesions. Freudenthal[8] has had good results in tuberculous ulcerations of the epiglottis and with ulcerative laryngitis, with the use of the **Fulguration Current** applied every two to three days for several weeks.

Codeonal is spoken of as a good hypnotic for use in laryngeal tuberculosis (*see page* 9).

Corditis Nodosa.—Laurent[9] cured a case by teaching the proper use of the voice. He uses low tones, pitched in the register below that in which the patient is accustomed to talk.

Chronic Stenosis.—Dupuy and de Poorter[10] have devised some special tubes with a low retaining swell, so placed that it impinges on that portion of the subglottic and tracheal areas which is a usual seat of the constriction. This tube reduces the possibility of auto-extubation, and effectively carries out the essential principles of dilatation. Persistent laryngeal stenosis in children has for its distinctive features exudative and inflammatory changes, with a narrowing of the respira tory lumen in the subglottic and other tracheal areas. While a pathological entity in itself, it must be considered as the end-result of some active inflammatory process which may be of diphtheritic origin.

Prolonged intubation offers the best prospects of success in overcoming the stenosis.

Mayer,[11] in cases of *cicatricial stenosis*, has obtained gratifying success by means of an **Intubation** tube. If dyspnœa is present, a preliminary tracheotomy is performed, and slow dilatation with Schroetter's tubes. These tubes are introduced three or four times a week for ten minutes at a time, and the largest size possible is used at each sitting. When the stenosed larynx admits a full-sized tube, the intubation is done. To prevent it from being coughed out, the author introduces it after the manner of John Rogers, junr. The full-sized hard rubber intubation tube is introduced into the larynx. The tracheotomy wound is anæsthetized, an applicator heated to white heat is thrust through the tracheotomy wound to mark the intubation tube, which is then extracted and the tracheotomy tube replaced. At the marked point on the intubation tube a threaded opening is made by the instrument-maker to allow of the introduction of a screw-piece attachment through the tracheotomy wound to prevent auto-extubation. The tube is worn for four or five weeks. The intubation tube, the operator's invention, has a hollow handle which, while holding the tube in position, allows the patient to breathe through the whole, and gives the operator as much time as is desired.

For an account of the **Radium** treatment of papillomata of the larynx, *see page* 67.

References.—[1]*Ann. Otol.* 1911, Sept.; [2]*Ibid.* 1912, Mar.; [3]*Bost. Med. and Surg. Jour.* 1912, Sept.; [4]*Jour. Laryngol.* 1911, Nov.; [5]*Ibid.*; [6]*Ibid.*; [7]*Laryngoscope*, 1912, Feb.; [8]*Ibid.* July; [9]*Jour. Amer. Med. Assoc.* 1911, Sept. 30; [10]*Ibid.* 1912, Sept.; [11]*Laryngoscope*, 1912, Jan., 42.

LEISHMANIASIS. *Leonard Rogers, M.D., F.R.C.P.*

W. B. Leishman[1] has published a comprehensive review of the literature of *kala-azar* and *tropical sore* during the last four years, much of which has already been dealt with in previous editions of the Medical Annual. He refers to the differences between the Indian and the African-Mediterranean-infantile forms, the latter differing in affecting children almost exclusively, and in being found naturally in dogs, which, as well as monkeys, can be readily infected artificially. Further, the parasite is more easily cultivated on blood agar, although Row and others have recently succeeded with this medium in the case of the Indian parasite also. No reliable form of treatment of either form has yet been discovered, salvarsan having given very disappointing results.

Basile, working in Sicily, has recently brought forward important evidence incriminating fleas as probable carriers of the infection in the Mediterranean form of the disease. Fleas taken from a dog proved free from the infection were fed on spleen pulp containing numerous parasites; subsequently he found the parasites in the gut of the fleas and infected dogs with their contents. Healthy dogs also became infected from diseased ones on being confined in a cage together with fleas, controls from the same litter remaining healthy.

Further, dogs were infected by fleas brought from a distance from a house containing kala-azar cases. Both *Pulex irritans* and *P. serraticeps* are able to spread the disease. The parasites are also passed in the fæces of the fleas, so indirect infection is thus conceivable. The fact that no animals have yet been infected by the parasites of Indian kala-azar makes such work at present impossible in that country.

Lastly, Leishman deals with tropical sore, which has recently been found in South America and the Canal zone, as well as in North Africa and South Italy. As shown by Row, the *L. tropica* of this disease can be grown at a much higher temperature than the organism of the febrile diseases, but no microscopical distinctions of importance are found between them. Nicolle, in Algiers, and Row, in Bombay, have infected animals with tropical ulcer through the skin, especially in monkeys. In the Sudan, Thomson and Balfour have described a non-ulcerating form of the disease. Various biting insects have been thought to be carriers of it, but no conclusive evidence is yet available on this point.

Treatment.—This is also unsatisfactory. Powdered **Permanganate of Potash,** or a 1 per cent solution, has recently been advocated, while Nicolle and Manceaux speak highly of **Arsenobenzol** in doses of 30 to 60 cgrams. A. E. Weld[2] tried injections of **Salvarsan** in two cases of infantile kala-azar at Malta. In one case no effect was produced, but in the other a remarkable diminution in the size of the spleen took place within forty-eight hours, and the patient's general condition steadily improved. He had, however, been free from fever for some days before the injection, so it is doubtful if the drug was responsible for the gain of 3 lb. in weight during the month he was under observation, such variations being common in the ordinary course of the disease. G. Caryophyllis and D. Sotiriades[3] report three cases of infantile kala-azar, one of which was treated with salvarsan; after seven injections some improvement was noted, but a few parasites were still present in the blood. A. Christomonas[4] records four cases of infantile kala-azar in which salvarsan was injected both subcutaneously and intravenously without any result, the parasites being unaltered in any way. G. Caryophyllis and D. Sotiriades[5] report a further case of kala-azar treated by intravenous injections of salvarsan during a period of four months, and observed an improvement after each dose.

R. Row[6] reports further work on tropical sore. He had previously transmitted the disease from man to monkey, and from monkey to monkey, by direct inoculation of the human stage of the parasite, but not through the cultivated flagellate stage. For work on the development of the parasite in flies it is necessary to breed insects free from herpetomonas infection, and to feed them on blood containing the parasite. Within three hours of such a feed, flies pass unaltered parasites by the rectum, which might infect a wound, but after that time they are digested and never developed into a flagellated stage. The same writer[7] records his experience of autogenous **Vaccine**

treatment of oriental sore. Under medicinal treatment these lesions take months to heal, and generally leave unsightly scars. The only treatment he had found of much use was 1 dr. of **Salol** dissolved in 1 oz. of olive oil and rubbed into the skin, which produced healing after a long time, without scarring. He has now tried injecting dead cultures of the parasite in the flagellate stage, ·25 c.c. of a seven-day growth being used, and in three cases obtained healing within three or four weeks. He also mentions that two kala-azar patients inoculated for him by Major Donovan with the parasites of oriental sore, did not become infected, while a control patient developed a typical sore, so that kala-azar patients appear to be immune to the local disease.

G. G. Jolly[8] and H. H. Broome[9] record favourable results from the treatment of oriental sore with **CO_2 Snow**, although the former gets equally good results by scraping. S. T. Darling[10] also deals with this disease in Panama, and advocates early free **Excision** as the best method.

REFERENCES.—[1]*Quart. Jour. Med.* 1911, 109; [2]*Jour. R.A.M.C.* 1911, [275; [3]*Deut. med. Woch.* 1911, 1896; [4]*Ibid.* 1705; [5]*Ibid.* 1912, 1554; [6]*Brit. Med. Jour.* 1911, ii, 828; [7]*Ibid.* 1912, i, 540; [8]*Ind. Med. Gaz.* 1911, 466; [9]*Ibid.* 1912, 107; [10]*Jour. Cut. Dis.* 1911, 617.

LEPROSY. *Leonard Rogers, M.D., F.R.C.P.*

TREATMENT.—Deycke[1] has summarized the results so far obtained by the use of his preparation, **Nastin**, an oily solution extracted from a streptothrix not at all identical with the real leprosy bacillus, combined with benzoyl-chloride. It has now been in use for more than three years, and Deycke has collected all the reported cases, excluding only those of the British Guiana Leper Asylum, the final results of which were not available. He now thinks it acts by producing the formation of real antibodies against the fats resembling nastin in the *Lepra bacilli*, and is thus an active immunizing body. He refers to the cultures obtained by Rost and Williams (*see* MEDICAL ANNUAL, 1911), and states that their results agree very closely with his own published as far back as 1904, and it was only after the failure of such vaccines as they are now advocating, that he improved on them with nastin. He gives tables of 469 cases treated with nastin by sixty-two doctors, including many not treated long enough to get good results, and shows 2·2 per cent cured, 6·2 per cent nearly cured, 24·4 per cent considerably improved, and 29·4 per cent improved, leaving 37·8 per cent not improved, worse, or dead, the last including only 1 per cent. A further analysis shows very similar results in the three classes of tubercular, anæsthetic, and mixed infections. These results surpassed his expectations, and considering the great chronicity of the disease and the advanced nature of many of the cases, they appear to mark a great advancement in the treatment of leprosy, provided it is persisted in for many months, preferably up to two years.

F. L. de Verteuil[2] reports on the nastin treatment of thirty-four cases at the Trinidad Leper Asylum. Some degree of improvement was obtained in over half of those treated for an average of six months,

and a cure in one patient. The best results were got in anæsthetic and mixed cases. In most of them **Chaulmoogra Oil** was also given, which may have caused some of the improvement.

T. S. B. Williams[3] has dealt fully with his researches on the bacteriology of leprosy and its treatment by a **Vaccine** prepared from his cultures (*see* MEDICAL ANNUAL, 1912). He obtained lesions somewhat resembling leprosy in guinea-pigs, while Rost produced in monkeys all the clinical features of tubercular leprosy, with acid-fast bacilli in the lesions. With the acid-fast form of the organism he obtained similar reactions in leprosy patients to those got by Deycke and others. He has obtained some improvement in patients by the prolonged use of a vaccine made from the acid-fast forms, and thinks the progress of the disease can be thus controlled, although it is too early to say if cure can thus be obtained. H. Bayon,[4 5 6] has also cultivated a pleomorphic organism from two leprosy patients in London, which closely resembles that first fully described by Kedrowsky, in Russia, as long ago as 1901, and subsequently by many others, including Deycke, Rost, Clegg, and Williams. Owing to its presenting such very marked morphological variations on culture, including a non-acid-fast streptothrix, a non-acid-fast diphtheroid bacillus, a definite acid-fast filamentous streptothrix, and an acid-fast bacillus which is a broken-down stage of a streptothrix, the work of the earlier observers did not receive the credit due to it. Bayon also summarizes the work done by various observers in infecting animals with leprosy, including rabbits, monkeys, mice, and rats, the last being also the subject of spontaneous leprosy indistinguishable from that produced by inoculation. He has succeeded in producing an antigen by alternate freezing and thawing and agitating with Hearson's shaker, with which he obtained fixation of complement with the desensitized blood of leprosy patients in considerably higher dilutions than with other diseases, so it may be of diagnostic value as a complement deviation test. He has commenced vaccine treatment of the disease. Whitmore and Clegg, in 1910, reported on a year's trial of a vaccine made from the cultures of the latter, but the results were entirely negative. E. R. Rost[7] makes a second clinical report on the vaccine treatment of leprosy, in which he relates further improvement in several of his previous twelve cases, together with records of ten more. Of the twenty-two cases, he claims five as practical cures, fifteen have shown marked improvement, while two showed no change. Photographs of some of the cases are given.

F. A. de Verteuil and F. L. de Verteuil[8] report a trial of **Salvarsan** in leprosy in Trinidad, giving it intramuscularly. The five patients showed some signs of improved general health, but very little change in the local conditions. T. L. Sandes[9] has also tried salvarsan at the South Africa Robben Island Asylum in thirteen cases, intravenously in all but one. Only two showed considerable improvement, and two more were slightly better, but the results on the whole were not encouraging. The same writer[10] records a number of carefully made

tests of various methods of treating leprosy, and tabulates the results in a clear manner. In each instance the treatment was continued until it was quite evident it had failed or the patients refused to go on with it. Completely negative effects were obtained with (1) an exclusively fruit and vegetable diet, (2) "Jagbert's root" cure, (3) thyroid gland, (4) a vaccine of leprosy bacilli, and (5) arsenical preparations (soamin and orsudan), while salts of iodine produced an actively injurious effect, four of the seven patients treated with them dying within a relatively short period. On the other hand, prolonged administration of **Chaulmoogra Oil**, both orally and hypodermically, produced slow but distinct improvement.

Bacteriology.—W. G. Liston and T. S. B. Williams[11] describe the cultural characters of a streptothrix isolated from the spleen of a leper, which showed the same marked pleomorphic characters of those previously described by Deycke and by Rost. Charles W. Duval and C. Wellman[12] describe a new method of cultivating leprosy bacilli from the tissues by means of a fluid extract of human placental tissue, alone or combined with glycerin agar. The same writers[13] publish a critical study of the organisms cultivated from human leprosy, based on twenty-two successful cases, from which they conclude that the extraordinary pleomorphic characters described by earlier workers are due to two different organisms often being present, one of which is a chromogenic strain similar to that described by Clegg, which has acid-fast and non-acid-fast forms, and the other a non-chromogenic strain, which is more difficult to grow, and which (serological tests suggest) is a distinct organism from the first, and much more like other pathogenic bacteria in its behaviour.

References.—[1]*Münch. med. Woch.* 1911, No. 34; [2]*W. Canad. Med. Jour.* 1911, 481; [3]*Brit. Med. Jour.* 1911, ii, 1582; [4]*Ibid.* 1269; [5]*Ibid.* 1912, i, 424; [6]*Jour. School Trop. Med.* vol. 1; [7]*Ind. Med. Gaz.* 1912, 257; [8]*Brit. Med. Jour.* 1911, ii, 655; [9]*S.A. Med. Rec.* 1912, Jan. 3; [10]*Jour. Trop. Med. & Hyg.* 1912, 65; [11]*Sci. Memoirs India*, 1912, No. 51; [12]*Jour. Amer. Med. Assoc.* 1912, i, 1427; [13]*Jour. Cut. Dis.* 1912, 397.

LEUKÆMIA. (*See also* Blood, Examination of).

Herbert French, M.D., F.R.C.P.

The value of the **X-rays** applied locally over the spleen region in the treatment of leukæmia is again emphasized by a series of five cases published by Biermann.[1] The leucocytes in the blood diminish, the spleen shrinks, the patient's sense of weakness and his abdominal discomfort are lessened; but it does not seem that life is prolonged, probably because the *x*-rays have hitherto been used comparatively late in the disease instead of as early as possible. Details of the method of administration are given in the paper, which should be consulted in the original. He used moderately hard tubes of from 10 to 12 w., at a focal distance of from 50 to 60 cm. The skin around the area to be treated was protected by thick lead-rubber sheeting. The current in the secondary generally amounted to 0·5 or 1·0 ma.; the duration of a sitting varied from eight to

fifteen minutes; sittings were on alternate days for a fortnight at a time.

It has been shown by various observers that colloid preparations of the heavy metals, injected hypodermically, lead to destruction of the white corpuscles in the blood, this leucolysis affecting the polymorphonuclear cells in particular. It occurred to Hughes Dayton,[2] therefore, to try the effect of colloid platinum in leukæmia. He hoped that it might reduce the leucocytes and relieve the patient. So far as he was able to judge, however, in the two cases in which he tried it, the patient received no benefit from the treatment.

Attention is drawn by Gordon R. Ward[3] to the fact that certain cases of leukæmia, especially of the lymphatic type, present extensive nodular deposits and infiltrations of many parts of the body, inside and out; and he suggests that such cases should be designated *nodular leukæmia*. He points out that cases of this sort have been reported under a great variety of titles, such as mycosis fungoides, chloroma, Mikulicz's disease, Kaposi's disease, sarcomatosis, and so on. He also points out the danger of performing operations in these cases, and says that the occurrence of apparently local lumps in connection with bones or soft parts has led to such mistaken diagnoses that the following operations have all been performed in error: excision of the upper jaw, complete mastoidectomy, amputation of both breasts, laparotomy, appendicectomy. The importance, therefore, of not forgetting that leukæmia may be the cause of all sorts of apparently local nodules and lumps is great; and blood-counts should be employed in testing the diagnosis more often than is at present the case.

So important is this subject that Dr. Ward's paper may be quoted at some length.

"The most common sites for these nodules are the bones, especially those of the skull, the skin and subcutaneous tissues, and the various sites in which lymphoid tissue is found in appreciable amount during health. There have been several explanations of their appearance, the most acceptable being that which supposes that they arise from pre-existing lymphoid foci, and that such foci are, as a matter of fact, present in all parts of the body. In support of this theory we have the rapid origin of lymphoid tissue in various parts of the body in other conditions. About the edge of an advancing cancer, for instance, there is often a zone of round-cell infiltration which is absent in benign growths, and some suppose that this is in the nature of a defensive development of lymphoid tissue. It is paralleled by the appearance of lymphatic glands in large numbers in the lymphatic system near a malignant growth. These glands are certainly far more numerous than could be expected from the examination of the corresponding tissues in a healthy person. It is also asserted that in old persons in whom the lymphoid tissues have undergone a large degree of physiological involution, the growth of a cancer will cause their reappearance. Moreover, in leukæmia the thymus gland is often greatly enlarged,

even when the disease has begun in adult life when the thymus should have been atrophic.

"We now pass to a consideration of the clinical characteristics of the nodules. They vary from a diffuse œdematous condition to an almost bony hardness. The œdematous variety has been chiefly reported as affecting the head and neck. In one recorded case there was a diffuse greenish infiltration of the scalp, and in Dr. Ward's own case the same was present. This is to be distinguished from the œdema which is common enough with tumours of any variety. But apart from infiltrations, there may also appear definite nodules of a fairly hard consistency. An ulcer may also occur where there is pruritus, but the latter is an infrequent symptom and ulceration is the exception.

"Coming next to those lesions which are more deeply placed, we find that two situations are mentioned with a strange frequency, viz., the eyelids and the breast. As there is no mesoblastic tissue that is free from infiltration, it is apparent that there is no limit to the variety of situations in which the deeper growths may arise. Nodules on submucous surfaces are especially apt to develop where lymphoid tissue is abundant, i.e., in the alimentary tract. Minute nodules on the gums are so common in acute cases that they are important diagnostic points; they are usually about the size of a mustard seed, but flatter than this simile might suggest. They are simulated by particles of food remaining in the mouth; it is therefore necessary to make sure that any suspicious nodule cannot be brushed away with a piece of lint or wool. There may also occur a general enlargement of the gums, even to the extent of hiding the teeth. This is, however, seldom if ever pure lymphoid growth. In some cases the tonsils have been enormously enlarged, and the same is true of the epiglottis. The lymphoid tissue at the back of the nose and at the base of the tongue is apt to be enlarged even before this is true of other structures. The stomach may be the seat of very extensive growth, as in a case recently seen by Dr. Ward, in which this organ was enlarged to three or four times its normal size and was wholly occupied by confluent nodules of various sizes. Nodules in the intestine and adjacent glands have been responsible for a great deal of trouble; thus, in one case there was considerable pyrexia, and a tumour in the abdomen of doubtful nature.

"As regards the distribution of the bone nodules, there is a distinct partiality for those of the skull. It is more particularly these cases which have given rise to the clinical conception of chloroma. In the majority the skull nodules have been the first to attract attention, but in some, such symptoms as sciatica have been first complained of, and have been found after death to be due to nodules on the pelvic bones. The bones most freely affected after those of the skull are the ribs. A sheath of lymphoid tissue round the long bones—e.g., the femur—has also been noted in a few cases. These bone nodules may give rise to an infinity of symptoms, and it is only necessary to mention

the most frequent. Of these exophthalmos takes the first place. In one case the eye was removed before the diagnosis was arrived at, i.e., before the exact nature of the growth was appreciated. It seems probable that in this case removal would have been accomplished by nature even if the surgeon had not intervened. The exophthalmos may be present without any growth in the orbit, but as a rule it means that the walls of the orbit are affected. Another common symptom is facial paralysis, which may be bilateral.

" Deafness and symptoms suggestive of cerebral tumour are not uncommon, but the size to which intracranial nodules may attain without these symptoms is often very striking. A visible sign of cranial nodules is often seen in a thickening of the tissues in the temporal region, which may give rise to the diagnosis of mumps in the early stages, and which sometimes produces a very marked appearance as if the face had been squashed between the temporal tumours. This appearance was very obvious in Essex Wynter's case, and is illustrated in his report of it.

" There are certain features which these nodules have in common, no matter where they may be situated. Of these the most important is what may be described as their instability. The skin nodules in particular are apt to vanish entirely for a time, and may be present only for a few days altogether. Dr. Ward has seen two cases in which it was said that there had been skin nodules present, but in neither were any to be seen at the time of his examination. This feature is well known in mycosis fungoides. The tumours in the skull seem less evanescent, but in one case at least they became very much smaller before death."

Carl Sternberg[4] records in considerable detail a number of cases in which, as the result of acute infection by streptococci or other organisms, death was preceded by changes in the blood similar to those seen in myeloid leukæmia; and he considers that acute fatal myeloid leukæmia as the result of acute microbial infection is not very uncommon, though it is frequently overlooked owing to the fact that blood examinations are not carried out systematically in cases of the kind. Many such cases are labelled purpura hæmorrhagica, scurvy, morbus maculosus Werlhofii, or even simple septicæmia. Some of the cases are fulminating, associated with high fever, a tendency to purpura and to hæmorrhage from mucous membranes, together with an ulcerous or even gangrenous stomatitis and gingivitis; enlargement of the lymphatic glands and of the spleen being generally insufficient to attract attention to the real nature of the blood changes.

Panton and Tidy[5] also draw attention to the existence of acute cases of myeloid leukæmia, and give instances. Their paper is based upon an analysis of twenty-five cases of both chronic and acute leukæmia that have been treated in the London Hospital during the last three years. They emphasize one particularly important point, namely, that the replacement in blood films of the ordinary granular myelocytes by non-granular forms is a sign of great danger. They bring evidence

to show that there is no sharp line of demarcation between the lymphatic and the splenomedullary varieties of leukæmia, and that sometimes a patient who has hitherto presented all the characters familiar in splenomedullary cases may towards the end offer so changed a blood-picture, that if seen then for the first time he might readily be regarded as a sufferer from the lymphatic as distinct from the splenomedullary type of the disease. As regards **X-ray** treatment, they allow that benefit has accrued in many instances, but they also point out that in some cases absolute harm has been done by their application over the splenic region, the course of the disease having sometimes seemed to be accelerated thereby. They allow that in the majority of cases both the number of leucocytes per c.mm. of blood and the size of the spleen are diminished by the *x*-ray treatment, but they lay much emphasis upon the fact that such a diminution in the number of leucocytes and in the size of the spleen may be no evidence of improvement, but actually the reverse. In two cases, intravenous injections of **Salvarsan** were given without apparent benefit. In one case there was a marked green pigmentation of the lymphatic glands, such as constitutes a direct connection between leukæmia and chloroma. Blood platelets are generally increased in ordinary cases of myelæmia, but towards the end they may disappear almost entirely, such disappearance being a serious sign, comparable to the replacement of the granular by the non-granular forms of myelocytes mentioned above.

Benzol is suggested by Professor A. von Korányi[6] as a new form of treatment. The idea was suggested by the fact that benzol has been shown in animals to produce first a rise and then a diminution of the leucocytes in the blood, with a marked aplasia of the bone-marrow, the spleen, and the lymphatic system generally. Korányi treated several cases in his clinic, and the remarkable degree to which the leucocytes diminished is exemplified by the following case :—

A woman, aged 32, had herself observed her splenic tumour during the previous seven months, and she had become gradually weaker, finding difficulty in doing her housework, and finally coming into hospital on January 30th. The spleen then extended to the middle line and for a hand's breadth below the umbilicus. The red corpuscles numbered 3,100,000 per c.mm., the white cells 220,000 per c.mm., and there were 16 per cent of myelocytes. Three grams of benzol were given daily from February 16th until March 1st, and then the dose was increased to 4 grams daily. The white counts were as follows : on February 23rd, 173,000, March 1st 198,000, March 22nd 120,000, April 4th 65,000, April 23rd 19,600, May 12th 12,000 per c.mm. The spleen altered little at first, but later diminished in volume rapidly. The red corpuscles rose to 4,000,000 per c.mm., and the patient gradually recovered and was able to resume home duties.

The following is Korányi's own summary of his results :—

1. Benzol leads first to a transient increase in the number of white blood corpuscles, and then to a pronounced improvement in the leukæmic blood picture. The diminution in the number of the leuco-

cytes begins for the most part at the end of the second or at the beginning of the third week, and after that progresses at first slowly and then faster. After the transient diminution, the number of red cells remains approximately constant, until later on an increase in them is to be observed. This phenomenon appears, he says, to occur in all forms of chronic leukæmia. The enlargement of the spleen diminishes at a late stage of the treatment. There was apparently less effect upon the lymphatic glands when these were enlarged. The general condition of the patient improves in a way comparable to that seen after treatment by the *x*-rays.

2. Benzol leads to this improvement more slowly than does *x*-ray treatment, but has the advantage of being applicable under circumstances when *x*-rays may not be obtainable. Patients who have already been treated by the *x*-rays appear to be benefited more rapidly by benzol than are those who have not had *x*-ray treatment.

3. Small doses of benzol appear to bring about leucopoiesis, and on this account fairly large doses seem indicated in leukæmia. From 3 to 4 grams of benzol were for the most part taken continuously for months, and in a few cases even 5 grams were given daily without ill-effects. There are, however, unpleasant concomitants in some instances, particularly a burning sensation in the stomach, a rising of the taste into the mouth, transient tracheo-bronchitis, and a tendency to faintness. The best way of avoiding gastric trouble is to give equal quantities of oil along with the benzol in gelatin capsules.

Korányi has also tried the treatment in cases of splenomegalic polycythæmia, in which the number of white corpuscles is normal. In one case, at the end of the first week from the commencement of the treatment the number of red corpuscles fell from 9,000,000 to 6,700,000, and the patient regarded himself as cured.

The treatment seems worthy of further trial; but one cannot help repeating that the improvement cannot be measured by blood-counts alone, for benzol has been known to produce very deleterious effects in healthy individuals, and it is essential to have the complete after-histories of a series of cases so treated, before pronouncing definitely in its favour.

References.—[1]*Deut. med. Woch.* 1912, 7; [2]*Med. Rec.* 1911, 509; [3]*Lancet*, 1912, i, 1195; [4]*Wien. klin. Woch.* 1911, 1623; [5]*Lancet*, 1912, i, 1328; [6]*Berl. klin. Woch.* 1912, 1357.

LINITIS PLASTICA. (*See* Stomach, Cirrhosis of.)

LIP, EPITHELIOMA OF. *Priestley Leech, M.D., F.R.C.S.*

Montgomery and Culver[1] draw attention to the origin of epitheliomata of the lip. They state that those beginning on the red portions of the lip originate on the surface and erode downwards. Almost all are end-results of seborrhœa, connected with a line of sebaceous glands that anoint the exposed mucous surface. This line is often visible in lips that appear normal, as a slightly shaded or glittering band that stretches like a bow across the front of the lip between one corner of

the mouth and the other. In the median line it is about ½ cm. above the cutaneous border.

The appearances vary; there may be much seborrhœa of the face and little on the lip, or vice versa. The scales become heaped up, and when these are removed, the tissue beneath is found eroded and cancerous.

REFERENCE.—[1]*Ann. Surg.* 1912, i, 227.

LIVER, RESECTION OF. *Sir B. G. A. Moynihan, M.S., F.R.C.S. H. Upcott, F.R.C.S.*

Bloodless Surgery of the Liver.— McDill[1] describes a method of controlling hæmorrhage during resections of the liver which does not need any special instruments other than a single intestinal clamp, 8 to 10 in. long, with its blades sheathed in rubber. After making the usual abdominal incision for exploratory purposes, a puncture is made through the abdominal wall in the right axillary line just below the costal margin. The clamp is introduced through this opening and, under visual guidance through the anterior incision, one blade is passed into the foramen of Winslow and the other in front of the right margin of the gastro-hepatic omentum, so as to include between them the vascular pedicle of the liver containing the portal vein and hepatic artery, thus giving complete control of the vascularity of the liver.

Great congestion of the gastro-intestinal branches of the portal system, blueness of the intestines, etc., indicate that the clamp should be loosened. It is probably safe to shut off the circulation for at least eight to ten minutes at a time.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 1283.

LUMBAGO.

The value of treatment by exposure to **Incandescent Light** is discussed on *page* 77.

LUMBAR PUNCTURE. *Oskar C. Gruner, M.D.*

Lusk's paper[1] is well worth perusal in the original. The following cardinal principles are enunciated. The posture of the patient should be one embodying pelvic extension (elevation of the sacral lever), for the purpose of assuring relaxation of the mesially lying sacral nerve-roots of the cauda equina, that they may the better elude the needle-point. Puncture should be made only in the fourth lumbar (preferably) or the lumbosacral interspace. The point of the needle should be aimed at the posterior median line of the spinal theca. It should be short to ensure its complete entrance within the subarachnoid space (Beir), and relatively blunt both for adding delicacy to the sense of touch (Sellheim), and to reduce to a minimum the liability of impalement upon it of the nerve-roots.

Entry is made on a point just lateral to the finger-tip on the interspinous interval in the median line. The needle can be felt to penetrate the ligamentum subflavum and then the dura mater. In *fat people*,

in whom the spinous processes cannot be differentiated by palpation through the skin, *the lumbar interspinous interval can be located* in two ways, one by prodding with a needle from a slightly lateral position across the median line structures, and the other by touching with the needle the lower border of a lamina near where it joins the spinous process. The latter site is recognized by its superficial location three-fourths to one inch beneath the skin surface, the conformation of a lumbar lamina exhibiting a rather prominent backward slope from above downward, so that its lower border overhangs considerably the upper margin of the lamina immediately below it.

The advantages of the lateral route over the median are five: (1) The needle can be guided more by the sense of touch; (2) A needle can be used with a less sharp point, which both aids the sense of touch and is less liable to cause nerve injury; (3) With a correct technique, the posterior mesial area of the spinal theca can be entered in almost as straightforward a direction as is possible by the median route, and apparently about as near the median line; (4) There is no danger of breaking the needle; (5) The operation is capable of performance, if desired, in the position of extreme lumbar extension.

REFERENCE.—[1]*Ann. Surg.* 1911, 449.

LUNG, ABSCESS OF. (*See also* LUNG, SURGERY OF.)

J. J. Perkins, M.B., F.R.C.P.

TREATMENT.—The advantages of the drainage of abscess of the lung by **Posture** are well shown in a case reported by McKechnie.[1] The patient, a boy of fourteen, had coughed up about a teacupful of pus in the twenty-four hours on an average for five years, and all treatment had been without benefit. The diagnosis made was abscess of the liver which had ruptured into the lung, on the ground of dullness to percussion at the base on the right lung continuous with that of the liver, and immobility of the right half of the diaphragm. The abscess cavities were only emptied when the pus rose to the level of the healthy portions of the bronchi and caused cough from irritation. That this surmise was probably correct was shown by the fact that when the patient was inverted far more pus was evacuated than in any one act of coughing.

The treatment based upon these suppositions was to hang the boy over the edge of a table, head and trunk downwards, only the legs and thighs resting on the table. This process was repeated five or six times a day. At first large quantities of pus were ejected, but the amount rapidly diminished, till in about six weeks none could be expelled. The general progress after this treatment of drainage was remarkable, the patient growing several inches in a year and becoming bright and cheerful. No other treatment was employed, and, as McKechnie suggests, it would be well to try this simple method of postural drainage before resorting to the more formidable procedure of operation.

REFERENCE.—[1]*Lancet*, 1912, i, 865.

LUNG, ACUTE ŒDEMA OF. *J. J. Perkins, M.B., F.R.C.P.*

Robin,[1] in laying down therapeutic principles, considers acute œdema of the lung a good example of an affection in which early treatment may rescue the patient from an otherwise certain death, and fortunately has no doubt as to the main lines to be followed.

Etiology.—He defines the condition as a flooding of the pulmonary alveoli with serum from the interstitial capillaries, the etiological factors in the production of the œdema being, according to him seven in number: (1) renal disease, (2) aortic affections and arteriosclerosis, (3) local conditions, e.g., pleurisy and pneumonia, (4) thoracocentesis, when the effusion is too rapidly withdrawn, (5) infective states, e.g., influenza, (6) certain affections of the nervous system, and (7) dyscrasiæ such as gout. Putting the matter more shortly, he holds that to bring about acute pulmonary œdema there must be a renal factor, or a cardio-arterial factor, or a broncho-pulmonary factor, with some accidental cause—for example, a chill—to start the process.

Symptoms.—Intense dyspnœa and cyanosis are the leading symptoms, with cough, accompanied by copious, frothy, albuminous expectoration slightly tinged with blood, the latter being the distinctive point in diagnosis, in harmony with which on auscultation, fine rales described as " intra-alveolar rain " are heard abundantly all over the chest. Other conditions with which acute pulmonary œdema might be confounded are pulmonary embolism, from the dyspnœa and suddenness of onset, the sputum however not being characteristic; asthma, the auscultatory signs of which, however, are those of an expiratory bronchitis, the sputum moreover being viscid and scanty; and the pulmonary types of uræmia, in which again there is not the characteristic abundant expectoration.

Treatment.—Immediate and energetic treatment is of course absolutely necessary, and here Robin gives the first place to free **Venesection** to the extent of at least a pint. Such free blood-letting he holds will in eight out of ten cases snatch the victim from the very jaws of death. Directly after bleeding he injects 1 or 2 c.c. of **Camphor** dissolved in oil, or **Benzoate of Caffeine**; applies six **Wet Cups,** and gives frequent doses of **Oxygen,** and **Stimulants,** such as champagne or strychnine, hypodermically. Nitrite of amyl is according to him distinctly dangerous, nor does he countenance the use of morphine, though in this he is not at one with other authorities. The patient's life once saved, attention must be directed to the underlying general condition, and treatment instituted for chronic nephritis (since acute œdema is most frequently the result of Bright's disease), and to the reduction of arterial tension.

Reference.—[1]*Med. Press*, 1912, i, 188.

LUNG, GANGRENE OF. (*See* Lung, Surgery of.)

LUNG, SURGERY OF. (*See also* THORAX, WOUNDS OF.)

H. Hartmann, M.D., Paris.

GENERAL TECHNIQUE.

The surgery of the lungs, for a long while neglected to some extent, has developed widely in the last twenty years, as a perusal of the proceedings of the last meeting of the International Society of Surgery[1] shows. For this development several causes are to be found (Hartmann[2]).

The accuracy of diagnosis has been increased by the introduction of radioscopy, radiography, and also stereo-radiography. Infection of the pleural cavity can be avoided by operating through a limited area circumscribed by natural adhesions, or, in the absence of these, by direct suture of the pleural layers. Operative pneumothorax is no longer to be feared. Two classes of methods are used to prevent it (Garré[3]). Those of the first type depend on a lowering of the extra-thoracic pressure; for example, in Sauerbruch's pneumatic chamber a negative pressure of 7 to 10 mm. is produced so as to overcome the pulmonary elasticity, the patient's head remaining at atmospheric pressure outside the chamber. In the other type the basic principle is increase of the intrapulmonary pressure, achieved by means of a chamber in which the head lies (Brauer), an extra- or intrabuccal mask (Davies and Mayer), or by an intubation apparatus (Kuhn, Durance, Delbet). Meltzer contents himself with intratracheal insufflation under pressure, and this has been applied to human surgery by Elsberg,[4] Lilienthal, and Unger.

These various methods are far from meeting with general acceptance. Many surgeons are content to avoid pneumothorax by making the initial opening into the pleura very small, so that air enters slowly; the lung is seized and drawn into the wound, which is then enlarged. These precautions suffice to prevent the untoward result which might follow, not inactivity of the one lung, but reduction in the hematosis of the other by the to-and-fro floating movements of the mediastinum.

After **Thoracotomy** (opening of the cavity of the thorax), whether by longitudinal incision of an interspace with forcible separation of the ribs, or by resection of a thoracic flap, a direct attack is made upon the lesion by means of **Pneumotomy** (*Plate XVIII, Fig.* 1) or even **Pneumectomy.**

Pneumotomy may be practised with a scalpel if the pulmonary parenchyma is hard, and poor in vessels; if it is soft, and freely vascularized, it is wiser to use the thermocautery. The advance must be gradual, and free access to the parts incised must be maintained, so that if necessary the cut vessels may be caught and tied. Lavage must be avoided, and in cases of gangrene only detached sloughs should be removed, those which are still partially adherent being left *in situ*, so as to avoid hæmorrhage.

Pneumectomy, studied experimentally by Glück and Biondi, has

been performed a few times in man. Limited resection of lung presents no special difficulty. To remove a whole lobe, the hilum must be reached, each vessel tied separately, and particular attention paid to the bronchial stump; a slipping of this ligature on the fourth or fifth day has been known to cause pneumothorax and emphysema of the mediastinum. Recently Guyot and Parcelier[5] have collected fourteen records of surgical treatment of primary tumours of the pleura or lung; and S. Robinson[6] has, on the other hand, considered the technique and results of pneumectomy for non-neoplastic lesions.

Operations for the Induction of Pulmonary Collapse ("Collapstherapie," of the Germans).—Two types of operation have been used to this end: the production of artificial pneumothorax, and thoracoplasty.

Artificial Pneumothorax, brought forward some years ago by Forlanini and Murphy, has been the subject of many communications during the past two years. Nearly all writers agree in injecting nitrogen into the pleura, since it is absorbed more slowly than oxygen. Forlanini,[7] who has recently returned to the subject, admits that an artificial pneumothorax may be formed not only when the pleural sac is wholly, but also when it is only partially, permeable, and even in cases of extensive impermeability if the adhesions are of a certain length, and breakable by mechanical means. The technique varies a little with the case. If the pleural cavity is free, its penetration by the needle is notified by the aspiration of nitrogen, as shown by a manometer attached to the apparatus; at this moment the pressure is increased. When there are adhesions, and the pleural sac cannot be found by aspiration, the needle must be introduced into the sac only a small distance at first, and passed in farther 1 or 2 mm. at a time, a little nitrogen being allowed to flow in under pressure at each forward step. Since Forlanini uses a needle with an opening 2 or 3 mm. long, he is able to explore the whole thickness of the pleura quickly. Failures depend either on the passage of the needle into the lung, or on the formation of an extrapleural loculus of gas.

In order to avoid the first of these accidents, Murphy, and after him Brauer, practised incision of the tissues down to the pleura under local anæsthesia, before puncturing the serous membrane. This procedure, to which the Germans, not knowing of Murphy's work, have attached the name of Brauer, has of late been extolled by Persch[8] and Klemperer.

Forlanini injects only 200 or 300 c.c. of nitrogen on the first day, renewing it on alternate days until the vesicular murmur is quite abolished; after this, a fortnightly or monthly injection is all that is necessary to ensure the permanence of the pneumothorax.

The operation is neither difficult nor dangerous (Klemperer,[9] Burnand,[10] Feulgen[11]). Volhard[12] commends it, but recognizes, nevertheless, that it takes a long time and repeatedly exposes the patient to the risk of a serous effusion. Faginoli[13] has noted this ten times in twenty-

three cases; happily, he says, these effusions are not serious and do not interfere with the success of the treatment. In England this method has been employed but little, though it is extolled by Rhodes[14] and Chitty.[15] [Also by Lillingston[16] and Vere Pearson.[17]—Ed.]

Billon,[18] with the object of combining an antiseptic action with moderate compression of the lung, injects from 200 to 500 c.c. of nitrogen bubbled through a gauge of gomenol. By varying the depth to which the nitrogen-carrying tube is immersed in the gomenol, a variable charge of antiseptic vapour is taken up by the stream of gas. In this proceeding, which Billon uses for consumptives of the first and second stages, there is no question of obliterating cavities by pressure; his aim is to compress the lung without immobilizing it, to plunge it in a bath of antiseptic, and exercise a revulsive action on it.

A final method of inducing retraction of the lung is **Ligature of the Pulmonary Vessels.** The experiments of Bruns and Sauerbruch showed that this proceeding is followed by peri-bronchial fibrosis, eventually involving the whole lung. Sauerbruch[19] has twice used this method in the human subject. Opening the chest in the fifth interspace, he reached the pedicle of the lower lobe by separating the upper and lower lobes at the interlobar fissure. The artery is above, the vein below, and the bronchus in the middle. Some weeks after ligaturing the vessels, he resected 10 to 15 cm. of several ribs.

Robinson's[20] experimental results were identical with those of Sauerbruch.

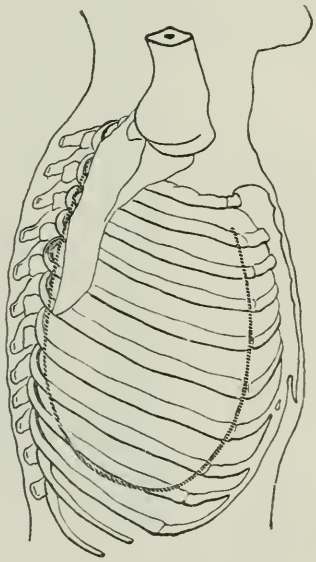


Fig. 89.—Thoracoplasty (Friedrich).

Thoracoplasty. — This is pre-eminently Friedrich's[21] operation (*Fig.* 89). It consists in taking away the bones of the thorax. In the first stage a wide V-shaped flap is cut. The incision begins a finger-breadth below the clavicle, passes down to three finger-breadths outside the sternal border, describes a large curve with its summit at the tenth rib, then rises again to the level of the second dorsal vertebra, finishing at a distance of three finger-breadths from the spine. The flap having been defined by this incision, the serratus magnus with its vessels and nerves is lifted up. The whole of this proceeding is carried out under local anæsthesia.

At this stage a little chloroform is given, and from 10 to 25 cm. of each of the ribs from the second to the tenth is resected, sparing the

pleura and thus achieving complete liberation of the lung with the pleura covering it. It is well to save the posterior periosteum and to fix the intercostal muscles between, so as to keep the mediastinum from falling back on the healthy lung, and also to prevent aspiration of the thoracic wall at each inspiration.

Operations Restoring Mobility to the Rigid Thorax.—To give the ribs that mobility which they lack, various methods are used: rupture of the upper costal arch by section of the first costal cartilage; the formation of a mid-sternal articulation (Hirschberg[22]); or resection of a series of costal cartilages. For this last proceeding, called Freund's operation, a slightly convex incision is made in line with the sternum, and 2 to 3 cm. are resected from each costal cartilage, the second to the fourth or fifth. The operation is completed by fixing the fibres of the pectoralis major to the edge of the gap thus formed, in such a way as toprevent its closure (*Plate XIX, Fig.* 2). Garré[23] has collected 57 reports with 5 deaths.

Braun,[24] instead of the curved incision described above, makes one along the right sternal border from the first to the fifth interspace, with a branching incision at each end, extending 4 cm. along the edge of the first and the fifth interspaces.

Indications.

Abscess and Gangrene of the Lung.—The writer follows Garré,[25] Körte,[26] and van Stockum,[27] in considering these lesions together, since it is often impossible to differentiate between them, and the treatment is the same. In both we must obey the general surgical principle of securing external evacuation of septic collections. Apart from those cases in which an immediately sub-pleural focus is complicated by empyema, and for which treatment as for empyema is usually enough, the method indicated is **Pneumotomy.** This generally brings about a cure in acute cases. In chronic cases the operation is followed by immediate improvement but not by cure, because the abscess cavity is surrounded by rigid sclerosed walls. In such cases a cure can be achieved only by adding to the pneumotomy a sufficiently extensive resection of the thoracic wall, free excision of the thickened pleura, and opening up of the substance of the lung. If a broncho-cutaneous fistula persists, its walls should be refreshed and then united by suture; if the fistula be pyo-bronchial, more efficient drainage is called for. A common cause of failure is the existence of multiple foci.

Collected statistical results are as follows: pneumotomy for abscess, 182 cases, 36 deaths (Garré); for gangrene, 149 cases, 44 deaths (Picot[28]), 281 cases, 84 deaths (Garré); giving a total mortality for the two lesions of about 29 per cent. Of statistics relating to the practice of individual surgeons and including abscess and gangrene in one group, there are the following: Karewski, 14 cases, 1 death; Körte, 53 cases, 16 deaths; Kissling and Lenhartz, 51 cases, 26 deaths; Külbs, 23 cases, 3 deaths.

PNEUMOTOMY

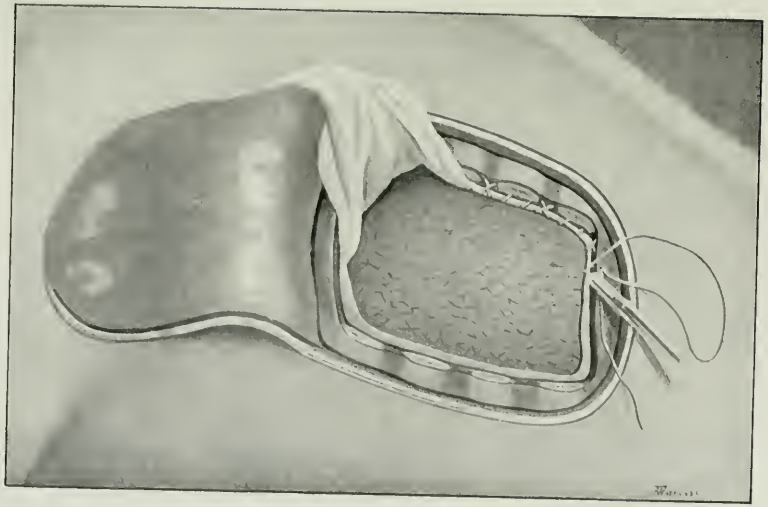


Fig. 1.—The lung is fixed to the chest wall by a continuous suture, which is ended above; here a compress is used to limit the field of operation still further.

PLATE XIX.

FREUND'S OPERATION

Fig. 2.—On the left side the line of incision is shown; on the right, the various steps of the operation are displayed in order from below upwards (stripping of a cartilage, resection, interposition of a strip of the pectoralis major between the cartilaginous ends, suture of the interposed pectoralis).

Bronchiectasis.—Here the results of **Pneumotomy** are less favourable than in abscess and gangrene of the lung. Körte had only 6 cures after 16 operations. Sauerbruch[29] in 123 collected cases found 40 cases cured, 7 improved, 33 unaltered, 43 deaths. This lack of success is due to difficulty in localizing the lesion, and also to the fact that the cavities are so often multiple. Scarcely any good is done by incision of the lung, except in cases of saccular dilatation with stasis at the bases. In more than half the "cures," fistulæ, chronic bronchitis, etc., persisted.

Of late years there have also been attempts to secure collapse of multiple cavities by means of **Thoracoplasty.** Sauerbruch has sought to induce fibrosis of a lobe by tying its artery. Heidenhain has resected the greater part of a lower lobe riddled with bronchiectases.

Hydatid Cysts.—The treatment of hydatid cysts of the lung by puncture, with or without parasiticide injections, should be abandoned. Over and above the general objections to be advanced against this line of treatment for cysts, there are special reasons against its employment in the case of the lung. First, there is the danger of sudden death at the time of operation; secondly, the danger of subsequent infection. In the pericystic membrane there are large vessels and bronchi with partially ulcerated walls. Either at the operation, or following the cough which it provokes, these vessels, deprived of the accustomed support yielded by the cyst full of fluid, are apt to burst, leading to severe hæmorrhage, a sudden flooding of bronchi by fluid not withdrawn by aspiration. The infection of the cyst is an even commoner accident, and may occur in spite of the utmost care, the needle becoming infected as it passes through the medium-sized bronchi, which contain an abundance of bacteria. The proper treatment for pulmonary hydatids is **Pneumotomy,** with free incision of the cyst and evacuation of the fluid with the daughter-cysts and parent membrane, followed by marsupialization and drainage or immediate suture of the cavity remaining after enucleation. Guimbellot,[30] who has collected 223 cases of cysts surgically treated, found 194 cures and 29 deaths.

Tuberculosis.—In a few instances **Pneumectomy** has been resorted to; the patients of Ruggi, Krönlein, Bloch, and Babcock died, while in only three was there a surgical success (Lowson, Stretton, Tuffier). One of these was not followed up, while the other two died later of pulmonary tuberculosis. To-day, therefore, this operation is abandoned.

Pneumotomy, followed by drainage, has yielded temporary improvement in a few cases of secondary infection, but no real cure. Usually all that it has done is to add a fistula to the lesions already present. Only one case, that of Sonnenburg, is described by various writers as a cure. As a matter of fact the "cure" was but temporary, for the patient died five years later of tuberculosis of both lungs. Pneumotomy has therefore fallen into disuse, like pneumectomy.

At the present day it is to **Operations Modifying the Respiratory Function** that surgeons are turning. In a few cases, with lesions strictly

limited to the apex, accompanied by narrowness of the upper thoracic outlet, a false joint has been made at the level of the first costal cartilage, on the assumption that the pressure of the first rib on the lung may predispose to the development of tuberculous lesions. Seidel, Birchner, and Kausch[31] regard their results as satisfactory.

A quite different mode of attack on unilateral tuberculosis aims at bringing about collapse of the lung, either by an **Artificial Pneumothorax,** or by **Resection of the Bones of the Thorax,** practised thirty-one times in twenty-nine cases by Friedrich,[32] with nine deaths during the year following operation.

Emphysema.—Various writers—Freund in particular—have shown that in some cases the lung is kept in a distended condition by a primary lesion of the thoracic cage, which fixes it in a position of forced inspiration. The lung, though distended, is not itself altered ; it retains its elasticity, and is capable of regaining its normal dimensions if set free from this mechanical stretching. This type of emphysema, with barrel chest, is ascribed to changes in the costal cartilages, which are increased in all their dimensions and irregularly deformed, having lost their normal elasticity and in many cases become partly calcified.

In these cases the antero-posterior diameter of the upper thoracic outlet is increased, and the manubrium is raised and fixed ; puncture of the cartilage with a needle gives a hard, rough, inelastic sensation ; the *x*-rays sometimes discover opaque spots in the cartilages, and render it possible to note the flattening of the diaphragmatic dome as well as lessening of its respiratory excursion.

The operation indicated is **Resection of the Rigid Cartilage** (Freund's operation—*vide supra*). According to the statistics of Roux-Berger,[33] the immediate mortality in thirty-seven cases was four. The end-results are good if the mobility remains, that is, if chondrectomy is strictly limited to cases of rigidity and dilatation of the thorax (Garré[34]). To this end the posterior perichondrium should be stripped up and a muscular bundle turned in between the cartilaginous ends.

Asthma.—Certain types of asthma are possibly related to thoracic deformities ; at least, there is one interesting case reported by Hirschberg, who cured the severe asthma of a rickety child with a pigeon chest by trans-section of the sternum. This observation, though unsupported by others, is worthy of attention.

Actinomycosis.—In pulmonary, as in all cases of actinomycosis, **Potassium Iodide** should be given by the mouth, and an attempt made at radical treatment in the shape of **Pneumectomy,** whenever possible ; or in other cases by free removal of the diseased areas and cauterization of what is left behind. Illich advises injection of 1–400 sublimate solution around the focus of disease, while Rydygier uses a 1 per cent solution of potassium iodide. The results are only moderate.

Pulmonary Embolism.—In recent years Trendelenburg has advocated surgical treatment of pulmonary embolism. He resects the second left rib, opens the pericardium, compresses the aorta and pulmonary artery with an elastic band, opens the latter, draws the

clot out of it, and pinches up the incision in the artery so as to suture it. Operative experience shows that it is possible to stop the circulation completely for a minute without untoward results, so that in theory this procedure is a rational one. Unhappily the results have not proved brilliant in practice, all the five patients so far operated on having died the same day or shortly after, though they bore the operation itself (Sauerbruch and Schumacher[35]).

References.—[1]*Soc. Internat. de Chir.* Brussels, 1911 ; [2]*Presse Méd.* 1912, 345 ; [3]*Soc. Internat. de Chir.* Brussels, 1911 ; [4]*Ann. Surg.* 1911, ii, 749 ; [5]*Rev. de Chir.* 1912, i, 810 ; [6]*Ann. Surg.* 1912, i, 513 ; [7]*Deut. med. Woch.* 1911, 2313, 2380 ; [8]*Wien. klin. Woch.* 1911, 1323 ; [9]*Berl. klin. Woch.* 1911, 2285 ; [10]*Presse Méd.* 1912, ii, 723 ; [11]*Deut. med. Woch.* 1912, 1125 ; [12]*Münch. med. Woch.* 1912, 1745 ; [13]*Ibid.* 1032 ; [14]*Brit. Med. Jour.* 1911, ii, 1062 ; [15]*Brist. Med.-Chir. Jour.* 1912, 141 ; [16]*Lancet*, 1911, ii, 145 ; [17]*Brit. Med. Jour.* 1912, ii, 957 ; [18]*Prov. Méd.* 1912, 283 ; [19]*Thoraxchirurgie*, 1911 ; [20]*Med. Klin.* 1912, vii, 599 ; [21]*Jour. Amer. Med. Assoc.* 1912, ii, 269 ; [22]*Jour. de Chir.* vi, 68 ; [23]*Soc. Internat. de Biol.* Brussels, 1911 ; [24]*Deut. med. Woch.* 1912, 1489 ; [25]*Lungenchirurgie* 1912, 2nd ed. ; [26]*Berl. klin. Woch.* 1912, 347 ; [27]*Soc. Internat. de Chir.* Brussels, 1911 ; [28]*Thèse de Paris*, 1910 ; [29]*Soc. Internat. de Chir.* Brussels, 1911 ; [30]*Thèse de Paris*, 1910 ; [31]*Deut med. Woch.* 1912, 878 ; [32]*Med. Klin.* 1912, 599 ; [33]*Thèse de Paris*, 1911 ; [34]*Soc. Internat. de Chir.* 1911 ; [35]*Thoraxchirurgie*, 1911.

LUNG, SYPHILIS OF. *J. J. Perkins, M.B., F.R.C.P.*

Pathology.—Syphilitic disease of the lung is said to be so rare that it hardly enters into clinical medicine, but Douglas Stanley has seen reason for the careful consideration of syphilis from his own experience in pulmonary cases. In the last seven years he has collected fifteen cases, all of acquired syphilis, and it must be admitted that the striking improvement which has resulted from appropriate treatment, justifies his contention of the importance of the diagnosis.

The frequency of syphilitic affections of the trachea and bronchi, compared with the lung, is well known, leading however to secondary pulmonary changes, among which dilatation of the bronchi is especially marked. Apart from these, Stanley recognizes the following effects in the lung tissue itself. First, there is a fairly rapid process which may be called syphilitic pneumonia, and is in fact an acute interstitial pneumonia, in which an intense cell proliferation not only fills the alveoli, but infiltrates all the connective tissues of the lung, the vessels showing changes typical of syphilis. Second, there is an early diffuse sclerosis, in which the lung though not yet misshapen is tougher than normal, and shows everywhere a great increase of connective tissue, and especially a marked proliferation of the elastic tissue. Miliary gummata are plentiful, and again there is characteristic endarteritis. In a third form, the lung shows a dense and more chronic sclerosis, being contracted and misshapen, while the pleura is usually much thickened and may be adherent. Gummata may be present as well.

Symptoms.—The symptoms in Stanley's cases, as well as the physical signs, bore a close resemblance to pulmonary tuberculosis. Hæmoptysis, cough, fever, night sweats, and loss of weight are noted in the

records, while the clinical signs mentioned are dullness, altered breath sounds and crepitation.

Treatment.—Many of these cases before coming into Stanley's hands had been treated for tuberculosis, with little benefit. However, when once the diagnosis had been established and anti-syphilitic treatment commenced, a striking improvement resulted, not only in the general health but in the pulmonary condition as well. The lesson to be learned from these cases is the importance of the search for tubercle bacilli in the sputa of all cases of pulmonary disease. Their absence on repeated examination was the final factor in the diagnosis of the cases reported.

Reference.—[1]*Brit. Med. Jour.* 1911, ii, 802.

LUPUS ERYTHEMATOSUS. *E. Graham Little, M.D., F.R.C.P.*

Treatment.—In recent cases Bunch[1] recommends **Quinine** in doses of 4 to 12 gr. per diem of the sulphate, combined with local application of **Lead Lotion,** or a paint of equal parts of **Rectified Spirit** and **Ether.** When there is much scaliness, this may be removed by rubbing with a mixture of equal parts of **Sapo Viridis** and lavender water, and the area then covered with this ointment :—

R	Sulphur Sublim.		Ung. aq. Rosæ	ad ℥j
	Zinci Oxidi	āā gr. xx		

Ichthyol gelatin or ointment (5 to 10 per cent) is also useful. When there is much hyperæmia, as well as scaliness, the lesions should be painted during the day with non-flexile **Collodion,** which is removed at night, and the following paint applied.

R	Zinci Sulphat.		Spt. Vin. Rect.	℥j
	Potass. Sulphurat.	āā gr. x	Aq. Rosæ	ad ℥j

In the fixed type of lupus erythematosus, the patches may be rubbed with a flannel soaked in **Tincture of Green Soap,** and then painted with pure **Phenol.** This treatment may be renewed in a week. Still more vigorous is the reaction with a paint composed of **Resorcin** 5 to 10 per cent in collodion, or with the following paint : salicylic acid 10 per cent, pyrogallol 30 per cent, flexile collodion 60 per cent. Or these pastes may be used :—

R	Past. Lassar.	℥j	Eosin. q.s. (to required tint)	
	Resorcini	gr. xxx		
R	Lenigallol	10%	Past. Zinci	70%
	Sulphur. Præcip.	20%		

These are to be applied daily, and dusted over with boric acid powder.

Freezing by means of **Carbon Dioxide Snow** is probably the most efficacious way of removing chronic discoid lesions. Firm pressure for twenty to thirty seconds is applied, and the part dressed with zinc ointment. **Ionization** with zinc or copper salts (2 per cent of zinc or copper sulphate) for twenty minutes with 2 to 3 milliampères is also recommended. *X*-rays are usually ineffective.

Reference.—[1]*Clin. Jour.* 1911, 395.

LUPUS VULGARIS. *E. Graham Little, M.D., F.R.C.P.*

The report of the Royal Commission on tuberculosis,[1] dealing with lupus vulgaris in twenty-one cases, establishes the fact that the bacillus is attenuated probably by some influence exerted by the skin. Both human and bovine types were isolated from the skin lesions, and attenuation was marked in both, as evidenced by inoculation experiments.

See also pages 19, 67, and 69 for description of treatment with **Nascent Iodine, Radium,** and **Thorium** respectively; also **Ionization** (*page* 73).

REFERENCE.—[1]*Brit. Med. Journ.*

LYMPHADENOMA. *Herbert French, M.D., F.R.C.P.*

E. Fraenkel[1] lays stress upon the fact that the only absolute method of clinching the diagnosis is to excise and examine one of the lymphomatous deposits, especially, when possible, one of the affected lymphatic glands. When one of these is cut into and looked at with the naked eye, the cut surface presents at the first glance a more or less shiny, smooth, homogeneous appearance, of a greyish hue, without any trace of softening or caseation, but closer examination reveals numbers of peculiar specks of whitish-yellow colour which are seen in no other affection of the glands. Microscopically, the large-celled hyperplasia seen in the sections is also very nearly pathognomonic. Although the glands do not suppurate or caseate, they seem undoubtedly to be the site of subacute recurrent inflammatory changes, which lead in some instances to remarkable fluctuations in their size, and in not a few cases the glands may enlarge with rapidity at one time, and yet a little later retrogress, and in some patients almost disappear spontaneously. This disappearance may constitute a striking feature in certain cases; it suggests that the disease is the result of some infection, and there is an increasing opinion in favour of this view, though its nature is by no means settled. Generalized enlargement of the lymphatic glands is familiar in certain cases of tuberculosis; it is also recognized in syphilis, but whether Hodgkin's disease is related to either of these or is a distinct infection has not been decided. There are some who still hold that it is a variety of tuberculosis. Fraenkel draws attention to the fact that there are practically never any changes in the retina in Hodgkin's disease like those often seen in leukæmia and pernicious anæmia.

Sinclair Gillies[2] records a striking instance of the alternate enlargement and shrinking of the masses of glands, coincident with the characteristic periodic rise and fall in the temperature chart over a long period, and this without apparently affecting in any way the downward course of the disease; the patient had become so familiar with the phenomena in his own case, that when seen with high temperature and in the throes of distressing dyspnœa from enlarged glands in the mediastinum, he would say, " The glands and fever will go down in a few days, and I shall be well for a week or more; " and his predictions were right.

The fact that the peculiar lymphoid deposits in Hodgkin's disease have been found in practically every organ in the body as well as in those parts in which one might expect over-growth of existing lymphoid tissue, forms another link connecting Hodgkin's disease with leukæmia, especially with that variety which Dr. Gordon Ward has recently drawn attention to under the heading of "Nodular Leukæmia" (*see* LEUKÆMIA). An instance in which the lymphomatous nodules were present in unusual places is recorded by Lees and Edgeworth,[3] in which, in addition to the more ordinary sites, there were deposits of lymphoid growth in the eyelids, the orbits, the temporal regions, and in the left male mammary gland; the diagnosis was confirmed histologically. The case was also noteworthy in that in the early stages it presented polycythæmia, the red corpuscles numbering at one time 6,300,000 per c.mm., though this was later replaced by anæmia. It also presented a greater degree of eosinophilia than is usual, even in Hodgkin's disease, the number of eosinophile corpuscles in the differential count being 14 per cent.

A. E. Finckh[4] summarizes existing knowledge in a clear clinical lecture upon the subject, and gives cases illustrative of each of the six clinical types distinguished by Ziegler, namely: (1) The acute form; (2) The localized form; (3) The generalized form; (4) The mediastinal form; (5) The latent type; and (6) The splenomegalic type. He is very pessimistic as to treatment, claiming that salvarsan has proved useless, and that *x*-ray treatment has only led to definite improvement in a very small proportion of cases. He advises that as soon as the condition is diagnosed or suspected, a thorough continuous treatment with **Arsenic** should be entered upon, lasting for two or three months, and accompanied if possible by **X-ray Treatment.**

L. Herschel Harris[5] takes a less hopeless view of *x*-ray treatment in Hodgkin's disease, his own experience being that if the rays are properly filtered and administered most cases of Hodgkin's disease are relieved by them, and some have remained so for years. He thinks that in early cases the rays thould be used alone in the first instance, and that then, failing response to them, arsenic should be prescribed at the same time. Thorough and correct dosage should be used, and all the affected areas should be attacked, including not only the spleen and the lymphatic glands, but also the liver for instance, if it is enlarged.

The characteristic relapsing pyrexia of lymphadenoma, one of the most striking charts of which is to be found in an article by Dr. Frederick Taylor in the *Guy's Hospital Reports*, 1906, vol. lx., p. 1, forms the subject of a monograph by A. S. MacNalty.[6] He points out that lymphadenoma with relapsing pyrexia may be classified into two main forms in which (*a*) The external lymphatic glands exhibit enlargement, with or without enlargement of the internal glands; (*b*) The internal lymphatic glands are alone affected. These forms comprise three distinct clinical types:—

1. The first with enlargement of the external glands. The glands

do not enlarge greatly. During the pyrexial periods they may be painful, soft, and tender, but they do not become attached to the skin, nor does the skin covering the glands become red and œdematous. The glands may remain of the same size during both the febrile and afebrile periods.

2. The second type is a very remarkable one; in the apyrexial stage the external glands may be small, freely movable, and free from attachment to one another or to the skin. With the onset of pyrexia the clinical picture changes with marvellous rapidity. The glands swell up, and a single gland may reach the size of a cricket-ball; they are hot, painful, and tender to touch; they are, apparently, adherent to the skin, and the skin over them is red or purple and sometimes œdematous. They closely resemble suppurative glands on the point of discharging pus. Then, as lysis occurs, the glands shrink down to their original size, and the pain, tenderness, and heat are in abeyance until the process is repeated in the next pyrexial period.

There is no more wonderful sight in medicine than to see one of these tense, inflamed, prominent glands, which the surgical tyro would itch to attack with a scalpel, shrink down to the size of a pea, only to be detected by palpation.

3. The third type is that in which the internal glands alone are involved and only general symptoms are present; dullness over the sternum, palpation of the abdomen, or *x*-ray examination may possibly determine the presence of these enlarged internal glands during life, or there may have been enlarged external glands at an earlier stage of the malady; these may have disappeared, and the patient may then come under observation with symptoms pointing to enlargement of the internal glands only.

MacNalty also discusses the relationship between tuberculosis and lymphadenoma, and he appears to have formed the personal opinion that lymphadenoma is distinct from tuberculosis, although many observers are still doubtful; he points out, however, how similar may be the relapsing pyrexia in patients who are certainly tuberculous, and he shows that cases of tuberculosis that simulate Hodgkin's disease are:—

1. *Chronic Pulmonary Tuberculosis with Recurrent Pyrexia.*—The finding of physical signs of pulmonary tuberculosis in the chest and of tubercle bacilli in the sputum tends to exclude the error. Early cases with no tubercle bacilli in the sputum, no abnormal physical signs in the chest, and that run a relapsing temperature, are exceedingly difficult to differentiate, as they simulate the type with no enlargement of the external glands.

If enlargement of the spleen occurs, it is more likely that the case is one of lymphadenoma; splenic enlargement is rare in chronic pulmonary tuberculosis, but may occur.

The converse error is more likely to be made and the case of lymphadenoma be taken for chronic pulmonary tuberculosis. A definite decision can be arrived at as the result of close observation of the patient and frequent examination of the sputum.

2. *Tuberculous Adenitis with Recurrent Pyrexia.*—These cases mimic lymphadenoma with enlargement of the external glands. If pulmonary tuberculosis is present, the glandular enlargement is more likely to be a tuberculous adenitis. Cases in which the lymphatic glands alone are affected with tuberculosis can only be differentiated, in the present state of our knowledge, by excising a gland under local anæsthesia and examining it under the microscope.

References.—[1]*Deut. med. Woch.* 1912, 637; [2]*Austr. Med. Gaz.* 1912, 599; [3]*Brist. Med.-Chir. Jour.* 1912, 150; [4]*Austr. Med. Gaz.* 1912, 593; [5]*Ibid.* 600; [6]*Quart. Jour. Med.* 1911, 58.

LYMPHATIC GLANDS, TUBERCULOSIS OF. (*See* Tuberculosis, Surgical.)

LYMPHATISM. (*See* Status Lymphaticus.)

MALARIA. *Leonard Rogers, M.D., F.R.C.P.*

G. E. Henson[1] discusses the etiological factors in malarial *recrudescences*, and concludes that pathogenesis is not a factor, but intracorpuscular conjugation is of greater importance, while asexual reproduction is the cause of short relapses. J. M. Woolley[2] deals with the prevalence and effects of malaria in the Andaman Islands, among the convicts. On two small islands, which are efficiently drained, the disease is absent, but among the settlements near the forests there is much malaria, especially in those near creeks. The most common parasite is the malignant tertian, and he thinks the incubation period may be as short as thirty-six hours. Chronic malarial cachexia is common. There appears to be a close relationship between the prevalence and deaths from dysentery and malaria, the latter predisposing to the former. The prophylactic issue of gr. 15 of quinine once a week did not yield satisfactory results.

P. Porot[3] writes at length of *visceral crises* occurring in the course of malaria. He gives cases illustrating abdominal crises affecting the stomach or the appendix; renal crises with diminished urine and hæmaturia; respiratory crises resembling asthma, and nervous crises simulating meningitis, hystero-epilepsy, and vertigo. The importance of recognizing the malarial element is the frequency with which the serious symptoms often yield to treatment with **Quinine.**

J. Tertius Clarke[4] writes on the association of nephritis with quartan malaria, which he regards as so frequent in the tropics that the presence of parenchymatous nephritis should lead to a search for these parasites. (*See also*, Blood, Examination of.)

Treatment.—W. M. James[5] has closely studied pernicious malaria in the Panama Canal zone, and presents a report on a method for the prevention of this very serious and usually fatal form. He agrees with former workers that the onset of pernicious symptoms can only be anticipated in time to prevent them by blood examinations showing very numerous malignant tertian parasites, one ring in twenty to twenty-five red corpuscles being very suggestive.

Such cases under treatment with ordinary doses of **Quinine** may yet suddenly develop fatal pernicious cerebral malaria. Following Italian and other authorities, he had given initial doses of gr. 20 to 30 of quinine by the mouth, followed by gr. 10 to 20 every four hours until the paroxysm had passed. Hypodermically, quinine is slowly absorbed, while intravenous injections in the dilution of 1–10, advised by Baccelli, were very dangerous, death having several times immediately followed their use. The paper of A. C. MacGilchrist (see last year's MEDICAL ANNUAL) convinced him of the importance of injecting quinine salts in high dilutions, although he does not agree with him that there is any objection to such solutions being given hypodermically, as he finds this a simpler and more efficient method than the intravenous one. He has now treated four cases with a very great number of parasites in the blood, six more with heavy infections, also two with moderate tertian infections but showing delirium or coma, with gr. 30 to 45 in dilutions of 1–50 to 1–75, subcutaneously, and repeating in equal amounts or less at intervals of four to eight hours, according to the severity of the infection. All recovered, although several of them were very grave cases. If pernicious symptoms are present, it will be well to inject the highly diluted quinine intravenously, in a dilution of 1–500. In two cases admitted in a comatose state, intravenous injections of highly diluted quinine failed to save. The importance of the recognition by means of the microscope of severe infections is thus clear.

M. Tuschinsky[6] has collected from medical literature, seventy-seven cases of malignant tertian malaria treated by **Salvarsan,** and concludes that it is very effective, especially if given intravenously in doses of 0·5 gram, repeated after ten days. Jul. Iversen and M. Tuschinsky[7] report five cases of malignant tertian malaria treated in the same way with very favourable results, the anæmia and splenic enlargement disappearing very quickly. They used 0·75 gram, and repeated it after ten days, without any unpleasant symptoms.

Barcanovich,[8] in Triest, has treated many cases of malaria with a compound of **Iron Cacodylate** and **Colloidal Silver,** in the proportion of 0·05 gram to 10 c.c., injected subcutaneously, and controlled his observations by microscopical examinations. The enlargement of the spleen disappeared, and the patient's general condition rapidly improved.

PROPHYLAXIS.—P. S. Lelean[9] takes strong exception to the following statement in a pamphlet circulated to civil authorities in India as a result of the experience of quinine prophylaxis in Punjab jails. "Take quinine regularly, and one is absolutely malaria-proof; neither mosquito campaigns, nor mosquito-nets, nor any other wonderful contrivance or device to deal with these insects are required." He quotes official jail statistics which he thinks show that quinine prophylaxis has not had much effect in reducing malaria, but as there is no proof as to how many of these fevers were really malarial, this part of the paper is not convincing. Later, he deals with certain

military figures indicating the apparent failure of various doses and intervals of quinine prophylaxis, where there is good reason to believe the drug was really taken. The most striking instance is that of Delhi Fort, where of 150 men doing garrison duty, more than a fourth were found to be harbouring malarial parasites; but here the extraordinarily large proportion of 35 per cent of culicifacies captured in the fort were infected by malarial parasites, so that there was continuous exposure to intense infection. At Delhi, 10-gr. doses of quinine were given on two successive days of the week, leaving five days without any, during which infection may have occurred. It is clear that the best method of using quinine prophylactically is not yet determined.

REFERENCES.—[1]*Jour. Trop. Med. & Hyg.* 1912, 33; [2]*Ind. Med. Gaz.* 1911, 409; [3]*Rev. de Méd.* 1911, 651; [4]*Jour. Trop. Med. & Hyg.* 1912, 133; [5]*Ibid.* 1911, 317; [6]*Deut. med. Woch.* 1912, 548; [7]*Münch. med. Woch.* 1912, 1606; [8]*Ibid.* 583; [9]*Jour. R.A.M.C.* 1911, 463.

MALTA FEVER. *Leonard Rogers, M.D., F.R.C.P.*

J. W. H. Eyre[1] deals with the relationship of Malta fever to the goat population of the island, and shows that the remarkable reduction in the disease in the services since goat's milk was prohibited has been well maintained. The number of goats has since declined, and the fever is now diminishing among the civil population, with the exception that a number of cases occurred among the keepers of the goats during a period when they refused to sell the milk and drank an unusual quantity of it themselves. In 1909, the municipal authorities obtained powers to destroy infected goats; in less than two years 461 milch goats were killed, and the incidence of the fever on the civil population has fallen to less than half of the former rate.

E. R. Gentry and T. L. Ferenbauch[2] have investigated the occurrence of Malta fever in Texas. In June 1911, Ferenbauch had obtained agglutination reactions in five cases, a number which is brought up to twelve by the present report, including the cultivation of the micrococcus from the blood of several patients. The affected part is a great goat country, and serum reactions have also been obtained with the blood of several goats, but cultures were unsuccessful.

A. Balduzzi[3] has treated three cases of Malta fever with a **Serum** prepared under the direction of Prof. Trambusti, and considers that it was both efficacious and harmless.

J. R. Mohler and A. Eichhorn[4] have investigated the diagnosis of Malta fever in goats by the serum test, and also by the new but complicated method of complement fixation, and conclude that the latter is the more reliable method.

REFERENCES.—[1]*Lancet*, 1912, i, 38; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 889, 1045, 1127; [3]*Gaz. Deg. Osp.* 1912, Jan. 2; [4]*Jour. Amer. Med. Assoc.* 1912, i, 1107.

MASTITIS, CHRONIC TRAUMATIC.

(*Vol.* 1912, *p.* 188)—Cheatle describes a patchy sclerotic inflammation of the breast, affecting the lower and outer quadrant pre-eminently, and cured by removal of the cause—pressure by whalebones and steels of badly-fitting corsets.

MEASLES. *E. W. Goodall, M.D.*

Symptoms.—In an epidemic at Cheltenham, Tait[1] observed 437 cases, and gives a chart which shows that the death-curve closely follows the curve of pulmonary complications in respect of age periods. Both are highest at the age of one to two years. He found that the pneumonia was due to Fraenkel's pneumococcus. Epistaxis occurred in 10 per cent of the cases. It came on just before, or within twelve hours after, the appearance of the rash.

Pathology.—Hektoen and Eggers[2] investigated the effect on the leucocytes of monkeys injected with the virus of measles. The blood of patients suffering from measles in the eruptive stage was mixed with citrate-salt solution (1 per cent sodium citrate in physiological salt solution) and injected into the heart or peritoneal cavities of four monkeys.

The experiments went " to show that in measles of the monkey the leucocytes appear to behave very much as they do in human measles ; that is to say, that preceded by a more or less distinct leucocytosis there occurs a leucopenia of variable degree in what would correspond in a general way to the latter part of the pre-eruptive and the early part of the eruptive periods." The neutrophils were chiefly involved in this leucopenia, the lymphocytes being relatively increased. The authors raise the question whether the blood-changes may not be ascribed to the injection of the foreign (human) blood-serum rather than to the virus of measles which it contained. [The question may legitimately be raised whether the reactions (including the fever and the rash), observed to follow the injection into certain monkeys of the blood of a human being suffering from measles, are not really " serum reactions " rather than the expression of measles infection. The rash in the monkeys experimented upon is said to be very slight, and in one of Hektoen and Eggers' experiments in which a rash was noted, Koplik's spots could not be found.—E. W. G.]

Anderson and Goldberger[3] have been continuing their experiments on measles. The nasal and buccal secretions from uncomplicated cases of measles during the eruptive period may be at times, but are not always, infective for the monkey. It should be noted that in none of the cases of measles from which the secretions were obtained were the catarrhal symptoms at all severe. These observers also tried to infect monkeys with epidermal scales taken from cases of measles at various stages after the appearance of the rashes. The results were uniformly negative, whether the inoculation was made by injection or by intranasal swabbing.

Other experiments with the blood of artificially infected monkeys lead the same investigators to the following conclusions: The virus in measles blood may (1) pass through a Berkefeld filter ; (2) resist desiccation for twenty-five and a half hours ; (3) lose its infectivity after fifteen minutes at 55° C. ; (4) resist " freezing " for twenty-five hours ; (5) possibly retain some infectivity after twenty-four hours at 15° C.

References.—[1]*Brit. Med. Jour.* 1912, i, 1476 ; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1833 ; [3]*Ibid.* 1612.

MEAT POISONING. (*See* PARATYPHOID FEVER.)

MENINGITIS. (*See also* CEREBROSPINAL FEVER.)

(*Vol.* 1912, *pp.* 203, 255, 395, 503)—For cerebrospinal meningitis of the diplococcal, epidemic type, the only adequate remedy is **Flexner's Serum.** The same worker promises a specific serum for the cure of influenzal meningitis. Otitic meningitis may, it is said, be checked by **Operation** if performed early enough. There is also a "circumscribed serous" form of inflammation of the spinal meninges, provoked by injury and certain infections, which produces symptoms of localized compression of the cord, and can be relieved by surgery.

MENOPAUSE.

Whether it be natural or artificial, it is claimed that the symptoms may be relieved by giving **Corpus Luteum** extract (*page* 10).

MENSTRUAL DISORDERS.

The claims of treatment by **Combined Glandular Extracts** are set forth on *page* 30.

MIGRAINE.

Counter-irritation is said to afford relief (*page* 11).

MINER'S NYSTAGMUS. *A. Hugh Thompson, M.D.*

ETIOLOGY.—This subject is of obvious importance in connection with the Workmen's Compensation Act. Following the teaching of the late Mr. Simeon Snell, of Sheffield, the chief factor in its causation has generally been considered to be the constrained position in which certain miners work. "With few exceptions," he says, "the miners have been those whose work has been done on their sides as 'holers.' . . . It is, I believe, a myopathic disease, a local affection, and as a result of prolonged strain in an unusual and constrained position, often for long and frequently recurring periods, . . . chronic fatigue in the ocular muscles is brought about, and atony being produced, oscillation of the globes is caused."

This view has recently been combated by those who believe that the main causative factor is deficient illumination. The whole subject is ably treated by Tomlin.[1] A remarkable fact is the very large proportion of coal miners in whom nystagmus occurs, but without causing any distressing symptoms. In some cases, apparently, the onset of symptoms may be determined by such causes as an injury to the eye, an acute infection such as influenza, or a debilitating condition such as anæmia. This fact is of obvious importance in relation to the question of compensation. Another fact is that patients in whom symptoms occur have usually worked in the mines a great number of years. Elworthy[2] found the average to be $21\frac{1}{4}$ years.

Tomlin does not attach any importance to errors of refraction as a cause of nystagmus. On the other hand, Browne and Mackenzie[3] found them in 90 per cent of their cases. Since, however, in their list of cases, such slight errors as + 0·5 in both eyes are included, it seems probable that an equally large percentage might be found among the general population. In this connection it is useful to consider the

cause of the nystagmus that occurs in infants. "For its production," says Tomlin, "it is necessary that there should have been some influence at work which has prevented the formation, upon either macula, of images which are clearer or more capable of accurate perception than those formed on other parts of the retina." Such a condition in infancy may follow a retrobulbar neuritis, possibly so slight as to involve the atrophy of the central fibres only, a choroido-retinitis implicating the macula, severe congenital cataracts, or corneal opacities resulting from ophthalmia neonatorum. It may also occur in albinism where there is a congenital reduction of the acuity of vision, and in adults it may follow any condition causing total blindness. In the case of miner's nystagmus, it is to be noted that it was never observed until some years after the introduction of the Davy safety lamp in 1850, and that the safety lamps now in general use, even when clean, give an illumination of considerably under one candle power, compared with the two or three candle power of torch or flare lamps. Court's[4] figures show that nystagmus occurred in nearly 30 per cent of miners working with the safety lamp, while those who used torch lamps or candles were almost entirely immune. Romiée,[5] of Liège, says that the incidence of nystagmus in Belgium, where the Muessler lamp (·44 c.p.) is used, is much greater than in Germany where the Westphalian lamp (·66 c.p.) is used, and mentions that where the Wolf benzine lamp (·87 c.p.) has been introduced into a mine, the case incidence of nystagmus has fallen by 50 per cent. "Consider the miner working in a dim light;" says Harrison Butler,[6] "he is constantly gazing on unrelieved black, sometimes dead black, and at others bright black. In this feeble light he sees not with his cones but with his rods, and these are in greatly diminished quantity at the macula, so much so that the visual acuity of the rods is at a maximum in a retinal band surrounding the fovea at a distance of 15° to 20° from it. In this annular ring the visual acuity is practically everywhere of the same value. In a good light we fix with the fovea, but in the poor lights of the mine, the miner can fix at any point on this perifoveal ring; he has no retinal directing point, and the necessity for central fixation is absent." Another factor is the crystalline surface of the coal face, which reflects light from innumerable facets, the one that happens to reflect most light into one eye being different from the one that reflects most light into the other. Thus the two eyes are brought into conflict. This is the only factor constantly present in coal mines, but absent in other mines where the illumination may be equally poor.

The alternative view (that of Snell) that miner's nystagmus is a myopathic disease induced by overwork of particular muscles, and analogous to writer's cramp, does not seem to have much to support it. The disease is by no means confined to "holers," who work in a constrained position. Nor do the elevators of the eye show any signs of fatigue, such as hyperphoria.

An important aspect of the question, however, has not yet been touched upon. In cases of gross nervous disease, the occurrence of

nystagmus is found to depend on disease of the mid-brain, corpora quadrigemina, pons, or cerebellum, never on disease of the cortex or of the nuclei of the cranial nerves. Hence it has been assumed that there exists somewhere in the mid-brain a "centre" for what may be termed the equilibration of the eyeball. Based on this assumption and on certain researches of Professor Sherrington, a theory of nystagmus has been developed by Gowers,[7] according to which it results from a deficient regulation of the reflex action of the eye muscles. This brings miner's nystagmus into line with that resulting from disease of the brain or semicircular canals.

The main practical points which emerge are that the development of miner's nystagmus coincides with the decrease of illumination, and that with improved illumination the number of men incapacitated by the disease decreases.

TREATMENT.—The first essential is **Cessation from Pit Work,** but there is no reason in most cases why above-ground work should not be followed. As many men develop symptoms only when the general health is impaired, this must be attended to, and strict **Temperance** in the use of alcohol is essential.

According to Tomlin, rapid onset is followed by early convalescence; and conversely, if the patient has been suffering for a long time without treatment, a very long rest will be necessary. Alcoholic patients are bad cases as a rule. He does not advise any man to return to work until one month after the disappearance of the symptoms. This does not necessarily demand the absence of physical signs, for nystagmus without symptoms does not inconvenience the miner at his work.

REFERENCES.—[1]*Med. Chron.* 1911, Oct. 17; [2]*Brit. Med. Jour.* 1910, Nov. 19; [3]*Ibid.* 1912, Oct. 5; [4]*Med. Chron.* 1911, Oct. 27; [5]*Bull. de la Soc. Belge d'Ophth.* XXV. 51; [6]*Ophthalmoscope,* 1909, 527; [7]*Proc. Roy. Soc. Med.* 1908.

MISCARRIAGE. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

McPherson[1] gives an analysis of 3,500 cases of abortion. He finds that the uterus rarely completely empties itself; in only 13·7 per cent was the ovum expelled entire. He insists that in all cases of abortion the uterus should be explored and cleared out.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 709.

MOLES.

(*Vol.* 1912, *p.* 486)—Several writers record success with treatment by application of **Carbon Dioxide Snow.**

MOLLUSCUM CONTAGIOSUM. *E. Graham Little, M.D., F.R.C.P.*

An epidemic of this disease is recorded by Hartzell[1] as occurring in an institution for young men, of whom about 5 per cent were found to be affected. The contagion was probably conveyed in the gymnasium and bath; when the affected students were withdrawn from these, the epidemic ceased. The most efficient treatment was found to be the destruction of the nodules by piercing them with a wooden probe soaked in **Pure Carbolic Acid.**

REFERENCE.—[1]*Med. Rec.* 1912, i, 1171.

MORPHINISM.

(*Vol.* 1912, *p.* 399)—Several methods of treatment are described in detail at the above reference. See also page 2 of the present issue on the use of **Adalin.**

MUMPS. *E. W. Goodall, M.D.*

Smith[1] reports two cases of acute orchitis following mumps, in which the testis was incised for the relief of tension and to prevent atrophy. The patients were young men, aged twenty-seven and twenty-two respectively. The tunica vaginalis was opened by a 2-in. vertical incision. Yellow turbid fluid escaped. The testis was then brought out through the incision, and the tunica albuginea slit with a knife in a dozen places, the incisions being not over one-quarter inch long, parallel to the long axis of the testicle, and extending just through the tunica. The testicular tissue showed no tendency to extrude. In both cases the epididymis was also involved, and the tunica covering it was scored in about six places. The testis was replaced and a drainage tube left in, and the scrotal wound closed round it. The scrotum was then bandaged tight.

According to Laveran and Catrin (quoted by the writer), atrophy of the testis occurs in upwards of 60 per cent of the testicular cases. It did not supervene in the two cases operated upon; but only a large number of such cases can decide whether or not operation will prevent atrophy.

REFERENCE.—[1]*Bost. Med. and Surg. Jour.* 1912, ii, 323.

MYALGIA.

(*Vol.* 1912, *p.* 85)—**Radio-active Bulbs** are warmly recommended by those who have experimented with this method. (See also RADIUM.)

MYASTHENIA GRAVIS. *A. Hugh Thompson, M.D.*

This disease sometimes comes under the notice of the ophthalmic surgeon before that of the physician, on account of ptosis and weakness of the other eye muscles, which may be the most prominent symptom. The extent of the weakness is apt to vary very much from time to time, hence the mistake has often been made of diagnosing hysteria. The weakness affects the whole muscular system. Very little is known of the pathology of the disease, but according to Taylor[1] an enlarged thymus has often been found post mortem in these cases.

The PROGNOSIS is as a rule bad, but Taylor mentions a case which in the course of some years has improved under the administration of **Thyroid Extract**, and suggests that the thyroid may possibly neutralize the effect of some secretion derived from an enlarged thymus.

REFERENCE.—[1]*Opth. Rev.* 1911, 173.

MYCETOMA. *Leonard Rogers, M.D., F.R.C.P.*

K. W. Mackenzie[1] describes the cultural characters of the black variety of mycetoma, as well as its appearance in cut sections, and obtained a mycelium in the former but not under the latter condition.

G. C. Chatterjee[2] deals with the same subject, and on culture also obtained delicate branching mycelial threads quite unlike the thick black threads found in the grains within the human tissues.

REFERENCES.—[1]*Ind. Med. Gaz.* 1911, 378; [2]*Ibid.* 376.

MYOSITIS OSSIFICANS.

(*Vol.* 1912, *p.* 356)—That form which is apt to occur in the muscles of the upper arm after dislocations of the elbow recurs after operative removal. The best treatment is **Rest** with the elbow flexed ; this reduces bony formation to a minimum.

NÆVI. *E. Graham Little, M.D., F.R.C.P.*

Bunch[1] again emphasizes his recommendation of freezing by **CO_2 Snow** or by **Liquid Air** as a treatment for nævi. Liquid air, being much colder, takes a shorter time than solid carbon dioxide, but this is its most important advantage, and the trouble and expense of procuring it make the carbon dioxide method practically superior. It is better to give several short exposures than a single long one. For after-treatment, the blister resulting from the freezing should be pricked antiseptically every time it collects fluid, and the surface dressed with boric or zinc ointment.

Friedlander[2] has noted excellent cosmetic results from treatment of even deep cavernous angiomata with freezing by CO_2 snow. Hair may grow upon the treated surface, which has a texture hardly distinguishable from normal skin.

References.—[1]*Brit. Med. Jour.* 1912, ii, 296 ; [2]*Ther. Gaz.* 1912, 22.

NAILS, FUNGOUS AFFECTIONS OF.

(*Vol.* 1912, *p.* 296)—Walker applies lint soaked in **Fehling's Solution,** kept in place by a finger-stall for a day or two ; the nail can then be removed with a pair of forceps, and the matrix is dressed continuously with **Copper Sulphate Solution,** 10 gr. to the ounce. This method is equally applicable to ringworm and favus.

NASAL ACCESSORY SINUSES, INFLAMMATION OF.

Geo. L. Richards, M.D.

Suppuration.—Hurd[1] considers the usual cause of accessory sinus trouble to be a deformed middle turbinate associated with a septal deviation, an enlarged ethmoid bulla, or a crowding of the uncinate process upon the naso-frontal duct, and superimposed upon these anatomical conditions, an infected nasal mucous membrane.

Hurd[2] says that 90 to 95 per cent of cases of sinus disease can be relieved or cared for by **Intranasal Treatment.** For external operation he employs the Killian method, and, in addition, removes the anterior wall in the large sinuses. So far he has had no difficulty from osteomyelitis.

Tilley[3] reviews the entire subject with the following conclusions. In acute maxillary sinusitis complicating a systemic infection, the inflammation of the mucous membrane is more general and intimate, and the patient's resistance is lower than when the suppuration is caused by a tooth, hence prognosis is less favourable to rapid recovery in the former than in the latter.

If the antral inflammation complicates a constitutional infection, e.g. influenza, in addition to the treatment of the general disease, every endeavour should be made to promote the spontaneous discharge of pus from the antrum. The patient should rest in bed with the infected sinus uppermost, and every hour or two equal parts of 10 per

cent **Cocaine** and **Adrenalin Chloride** should be applied on cotton-wool mops to the middle meatus region. This will induce contraction and ischæmia of the mucosa, and promote the free discharge of pus from the " ostium " in the middle meatus. **Hot Fomentations** to the affected cheek, and **Aspirin** 10 gr. every four hours, will go far to alleviate local pain and discomfort. When a diseased tooth is the cause of trouble it should be removed, the alveolus perforated, and a temporary alveolar plug inserted. The antrum can then be irrigated twice daily until the inflammation has subsided, when the alveolar passage may be allowed to close.

If bacteriological examination of the pus shows that one organism is present, or is in great predominance, an autogenous **Vaccine** may prove a valuable adjunct in treatment ; but acute attacks tend to recover quickly in any case.

Emphasis must be laid on the importance of always suspecting sinus suppuration when the patient complains of chronic nasal catarrh, and especially if pus is contained in the nasal mucus or on the handkerchief. A " morning headache " in a patient who has lived in malarial climates might easily be misleading as to antral suppuration, but a positive diagnosis can be made by the detection of pus in the middle meatus, by transillumination of the antra or puncture of the sinus by a fine trocar passed through the inner antral wall.

When nasal polypi, and therefore ethmoidal inflammation, accompany antral suppuration, the prognosis will be less favourable unless radical surgical measures are carried out. In the majority of chronic cases, the best drainage is secured by an opening in the inner wall, but the sinus is first entered through the canine fossa. The attempt to treat chronic antral suppuration by drainage through the buccal socket of a bicuspid or molar tooth, relieves but does not cure. The tube or plug, whether gold or vulcanite, rarely drains the suppurating cavity, but allows organisms and particles of food to gain access to the antrum from the mouth.

In chronic cases of long standing, no procedure short of operation will effect a cure, since the mucous membrane has undergone gross degenerative changes. If nasal polypi and ethmoidal inflammation accompany antral suppuration, the prognosis is still less favourable. Internal medication and change of air are quite useless. Lavage may be tried for a time, but usually without result. The diseased mucous membrane must be removed, and free permanent drainage provided through the nose by making a large opening in the inner antral wall after preliminary removal of a sufficient amount of the inferior turbinate bone, or by the same procedure together with the removal of the anterior wall of the antrum in the region of the canine fossa (Caldwell-Luc operation). This latter is preferable, as it gives access to all the diseased mucous membrane of the antrum. Alveolar drainage in chronic antral inflammation is to be condemned.

The same principles apply to chronic ethmoidal and frontal sinus inflammation, viz., treatment must result in free drainage and as

thorough removal of diseased structures as is prudent and safe. Operative procedures in these regions should be performed only by those conversant with the anatomy, endowed with a keen tactile sensibility, and skilled in nasal surgery. Most cases of acute inflammation of the frontal sinus recover spontaneously, since free drainage under normal anatomical conditions is provided for. Operating by the intranasal route seems on the increase, many authors advocating it.

Richards[4] found in eighty-one cases of inflammation of the frontal sinus, 59·2 per cent acute, 7·5 per cent subacute, and 33·4 per cent chronic. Eighty-five per cent of these complained of pain (headache or severe frontal pain), or pain with discharge. Ten had discharge only; one had pain plus exophthalmos, another general anæmia and pus absorption, and only one had an opening in the cheek. Forty-one of the acute cases were caused by "grippal cold," in thirty-five the cause was unknown. Swelling of the fronto-nasal duct was the direct cause in one. Ethmoiditis, antral suppuration, fast automobiling and riding, and dust inhalation are likely causes for a considerable number. In nineteen both sinuses were involved, the left alone in twenty-six, and the right in thirty-six. Sixty-five cases were treated intranasally by syringing with some simple sterile saline solution of the Seiler tablet type. Thirty-two of these required the removal of the middle turbinate before beginning treatment. Sixteen cases required an external operation, with re-opening or enlarging of the fronto-nasal duct and clearing out of the ethmoid cells as far as possible, and after-treatment either by immediate closure of the external wound, or closure at the end of ten days.

Cott[5] describes what he calls "latent sinusitis." The bone may be bare, and the cavity filled with degenerated tissue. There is a suppurative, hyperplastic, and dry stage. Many symptoms result, both direct and remote. The condition is amenable to treatment.

Horn[6] regards the Killian operation as defective, in that dead spaces are left, drainage is difficult, and the result uncertain. The operation is dangerous, and should be performed only under the most urgent conditions. Before performing it, intranasal treatment should be tried for months.

Mucocele.—Hall[7] reports a case of mucocele of the frontal sinus in which there were marked swelling and protrusion of the left eye, and considerable diplopia. Hastings[8] in his report of forty cases of mucocele of the nasal accessory sinuses found, as a rule, no nasal discharge, and nothing abnormal on intranasal examination, while external signs only indicated a slowly growing tumour at the inner angle of the orbit, which was tense, often surrounded by a thick bony margin, and without fluctuation. The eye was often displaced, but seldom affected. The skin and overlying tissue were normal, unless secondary septic infection had occurred. The ethmoid cells were affected in twenty cases, the frontal sinus in twenty-three, the sphenoid in two, and the maxillary antrum in only three; while in the other two cases there was bulging of the alveolar process. In ethmoid cases, when the cyst is bulging in

the middle meatus, the tumour may be removed without external operation, otherwise the orbital swelling is the point of attack. The whole cyst is removed, including the nasal segment, and free drainage established. The frontal cases, in addition to the removal of the growth, demand good drainage in the nose. In the maxillary antrum cases, the intranasal operation is usually sufficient ; if not, the external method is resorted to.

Ocular Complications.—Sluder[9] attributes nasal headaches, with inability to use the eyes, to closure of the frontal sinus. Out of one hundred and forty-five cases, 99 per cent were due to this cause. If applications of simple astringents fail to reduce the swelling of the soft tissues which close the outlet to the sinus, the author endeavours to free the outlet to the anterior labyrinth of the ethmoid by removing the anterior two-thirds or three-fourths of the middle turbinate, about 2 mm. from the cribriform plate. In the majority of cases this opens the sinus, the headaches stop, and the eyes function normally.

Brawley[10] claims that asthenopic symptoms due to sinus disease are usually reflex, though sometimes due to a toxic process or stasis in the orbital circulation resulting from the circulatory disturbances within the diseased sinuses. Diseased ethmoidal cells are found to be more often the source of ocular trouble than the frontal and maxillary sinuses. The *x*-ray and vacuum methods of diagnosis aid in finding sinuses causing ocular inflammations. The difficulty of differentiating between orbital disease of sinus origin and that due to new growths is eliminated by nasal findings, skiagraphs, temperature, and differential blood-count.

Wallis,[11] as a result of further study of the visual fields in twenty-three cases of antral, frontal, and general sinusitis, reaches the conclusion that peripheral field contraction occurs in fully 90 per cent of all sinus cases, and is usually caused by the action of toxins upon the nerve ; the more common is concentric contraction. Central and ring scotomata do not ordinarily occur in anterior sinusitis. Treatment is most beneficial in acute suppurations. The perimeter should always be used in suspected sinusitis. Normal fields help to negative, and contracted fields to confirm the diagnosis. White and green are the best test objects.

Fatalities.—Henke[12] reports a death after the Denker maxillary sinus operation. Pulmonary abscess developed, probably due to pus aspiration, and fatal hæmorrhage resulted. Claus[13] reports one case of air embolism and one of apoplexia cerebri, following douching of the maxillary antrum, also two fatal terminations after the same procedure. In one case the autopsy findings were negative ; the other showed hæmorrhages in the cardiac musculature and the brain.

References.—[1]*Canada Lancet*, 1911, Nov. ; [2]*Ann. Otol.* 1911, Dec. ; [3]*Lancet*, 1911, Oct. ; [4]*Laryngoscope*, 1912, Feb. ; [5]*Buff. Med. Jour.* 1911, Aug. ; [6]*Jour. Amer. Med. Assoc.* 1911, Sept. 2 ; [7]*Laryngoscope*, 1912, July ; [8]*Ann. Otol.* 1911, Sept. ; [9]*Ibid.* 1912, Mar. ; [10]*Laryngoscope*, 1911, Oct. ; [11]*Laryngology*, 1911, Oct. ; [12]*Arch. f. Laryngol.* 1911 ; [13]*Passow's Beitrag.* 1911, iv, No. 1.

NEPHRITIS. *Francis D. Boyd, M.D.*

Etiology.—Bauer[1] points out that, in a very large number of patients suffering from *syphilis* with albuminuria, the Wassermann reaction can be obtained, not only in the serum but in the urine, and that the globulin fraction of the urine is the bearer of the specific body. This may indicate either that the globulin portion of the blood-serum is the bearer of a specific body, or that a local spirochæte disease of the kidney is the factor producing the urinary reaction.

It might have been expected that nephritis would be frequently proved to be syphilitic, as no other cause could be found in most cases; yet in a series of cases of nephritis occurring in three years, only three were proved syphilitic in origin. Records of these are given, and, from the clinical signs and symptoms, all were suffering from amyloid disease of the kidney. In two there was no explanation except syphilis for the amyloid degeneration, which was entirely confined to the kidneys. In the third there was probably a general visceral amyloid degeneration, which was also only explainable through syphilis. All three gave the Wassermann reaction in the urine. The author concludes that a syphilitic infection is doubtless the cause of certain diseases of the kidney, but that this is rare. The disease can be as well explained as resulting from a toxæmia, as by the actual emigration of spirochætæ into the kidney. The Wassermann reaction in the serum is valuable from the diagnostic point of view, and it is present in the urine, especially when the globulin content of the urine is high.

Lippmann[2] discusses a number of cases of *hæmorrhagic nephritis* occurring in the course of purpura hæmorrhagica, and finds it is by no means an uncommon complication. Where the condition is not severe, it follows a benign course. As a general rule, however, it shows itself as a chronic interstitial hæmorrhagic nephritis, which may persist for as long as a year without having any deleterious effect on the heart or blood-vessels. The most severe form passes, in the acute stage, into uræmia. As explanation of the condition he draws an analogy between it and the glomerular emboli in endocarditis verrucosa.

Prognosis.—Ernberg[3] discusses whether acute post-scarlatinal nephritis may develop eventually into a chronic type. A large number of individuals who were treated for acute nephritis in youth, were examined sixteen to twenty-three years later. During the years 1885 to 1892, 106 cases of acute nephritis in children under fifteen years of age, and 50 in young persons between fifteen and thirty, were treated in hospital. In the later examination of those cases the urine was very carefully, and usually repeatedly, examined, and the heart and blood-pressure were observed. Seventeen patients under fifteen years of age died in hospital from the original disease, and of the 89 who left hospital 61 were examined later. Twelve patients over fifteen years of age died in hospital, and of the 38 who left hospital, 18 were examined later. Of those who as children suffered from acute nephritis and survived, 69 out of 81 were examined sixteen to

twenty-three years later. Of these, 43 showed no bad effects whatever of their previous acute nephritis, and practically the same result held good for the patients over fifteen years of age.

Ernberg therefore concludes that acute nephritis in youth is a disease to which the patient rapidly succumbs or from which he completely recovers. Though unable to state positively that the condition never develops into a chronic nephritis, he considers that everything points to this occurring so seldom that it is unnecessary to consider such a possibility when dealing with the prognosis of a case of acute nephritis in youth. Acute nephritis in children or young people, as a rule has no serious sequela in later life. It may be followed by albuminuria for some time during the convalescence and later sound health of the patient, but this symptom is of no serious importance in the absence of other signs of disease, and acute nephritis does not predispose towards orthostatic albuminuria.

TREATMENT.—**Diet.**—Kakowski[4] points out that it is not very well known which plant products are harmful, which are indifferent, and which are valuable articles of diet in nephritis. He carried out very careful observations, checked by urinary analysis, on the therapeutic value of tomatoes, spinach, nettle-tops, and sorrel.

Tomatoes are generally forbidden in gout and nephritis, the prohibition resting on tradition, as there does not appear to be sufficient scientific ground to account for it from the chemical standpoint. Tomatoes contain 93 per cent of water; ·29 nitrogenous substance; fat; sugar; a very small percentage (·14) of common salt; a trace of iodine; and citric, malic, and phosphoric acids. The author found that tomatoes exerted no harmful influence on the disease, even when given freely. There was a slight increase in the patient's weight, due to improved nourishment, and not to œdema. There was, at the same time, a notable increase in the quantity of urine, and as tomatoes formed a pleasant variety in the diet, the appetite was increased. The patients under observation were suffering from chronic parenchymatous nephritis; chronic interstitial nephritis, with acute exacerbation; and acute nephritis. Further observations on vegetable substances, such as spinach, nettle-tops, and sorrel, showed that they were useful, and in no case deleterious.

REFERENCES.—[1]*Wien. klin. Woch.* 1911, 1458; [2]*Deut. med. Woch.* 1912, 1407; [3]*Nord. med. Arkiv.* 1911, *Afd.* ii, *Heft* 2; [4]*Berl. klin. Woch.* 1911, 1924.

NEURALGIA, TRIGEMINAL.

(*Vol.* 1912, *p.* 96)—Even obstinate cases may be checked by **Salicyl Ionization.**

NEURASTHENIA.

For the use of **Combined Glandular Extracts,** *see page* 30.

NEURITIS.

Allusion to the use of **Counter-irritation** will be found on *page* 11, and to **Salicyl Ionization** on *page* 72.

NEURODERMATITIS. *E. Graham Little, M.D., F.R.C.P.*

Tomkinson[1] advocates the use of the **Vacuum Electrode** (high-frequency current) in this condition, which is so rebellious to treatment. Combined with the daily application of **Salicylic Acid** and **Oil of Cade** ointment, the low vacuum electrode may be applied two or three times a week.

Reference.—[1]*Brit. Med. Jour.* 1912, ii, 302.

NIGHT BLINDNESS. (*See* Visual Defects.)

NOSE, DISEASES OF. (*See also* Rhinitis, Fibrinous.)

George L. Richards, M.D.

Treatment.—*Congenital Atresia of the Choanæ.*—Attal[1] discusses the subject in general, urging attention to the matter as soon as discovered, opening up the way, and keeping it open with rubber tubing; while Koch[2] reports a case in an infant of eleven months. Here there was an osseous diaphragm which was kept open with iodoform gauze. One side was operated upon first, and the second some three weeks later. There was complete cure in six weeks. The reviewer has had one such case in which the occlusion was only a short distance from the point of the nose. He found it difficult to keep the edges from uniting after the operation, but eventually success was attained.

Ozæna (*Atrophic Rhinitis*).—Glegg[3] gives the following formulæ for nasal lotions: first taking as a standard a solution of sodium chloride, 0·8 per cent (70 gr. to the pint), and replacing part of the sodium chloride with other salts in the proportion arrived at by the means described. The following may be taken as an example. The figures which represent the grains per pint give the ratio in terms of sodium chloride. The second formula gives a solution isotonic with the first:

Chloride of sodium	60 gr.	=	**Chloride of Sodium**	60 gr.
Chloride of sodium	5 gr.	=	**Sulphate of Sodium**	20 gr.
Chloride of sodium	5 gr.	=	**Phosphate of Sodium**	20 gr.
Water to one pint.			Water to one pint.	

For cases such as atrophic rhinitis, the following prescription is given:—

R	Sodii Chlorid.	℥vj	Sacch. Alb.	ad ℥iij
	Sodii Sulphat.	℥ij	Thymol	gr. iij
	Sodii Phosphat.	℥ij	Menthol	gr. iij
		Aq. ad ℥vj.		

Dilute two teaspoonfuls with warm water (about 90° F.) to half a tumblerful, to make a nasal lotion of the required strength. This formula may be dispensed in the form of compressed tablets, by using salts from which the water of crystallization has been driven off. Allowance has to be made for reduction in bulk when calculating the amounts required. The crystalline sodium phosphate readily parts with its water of crystallization, and rapidly makes a powder moist.

When a preparation is required in the form of powder, the following formula will be found useful. It is cheaper, and will remain dry in a

wooden box for at least a fortnight under ordinary conditions. Sodium bicarbonate is substituted for sodium phosphate, and in consequence it does not make so bland a lotion as the other, but serves its purpose in the majority of cases :—

℞	Sodii Chlorid.	℥v	Sodii Bicarb.	℥ij
	Sodii Sulphat.	℥iv	Sacch. Alb.	ad ℥iij

Dissolve a level teaspoonful of this powder in half a tumblerful of warm water.

Grant[4] recommends the use of a Higginson's syringe or Leffert's coarse spray with 1 per cent solution of **Zinc Chloride.** For simple rhinitis he uses :—

℞	Sodii Biborat.	gr. xcvj	Glycerini pur.	℥lxxij
	Sodii Salicylat.		Aq. Menthol. (made like	
	Sodii Chlorid.	āā gr. xlviij	camphor water)	ad ℥vj

A teaspoonful in about 1 oz. of warm water.

Beck[5] has obtained most satisfactory results in atrophic rhinitis by **Paraffin Injections.** In cases not yielding to usual local treatments, he removes the middle turbinate and curettes the ethmoid. Following the healing of this operation and the continuance of the local treatment for two months, the submucous dissection of the mucoperichondrium and periosteum is performed, and a quantity of paraffin, with a melting point of 120° F., is placed in the pocket created, and the small incision closed with a suture, or the lips of the wound coapted and a loose tampon put in to retain it.

Cobb and Nagel[6] find that injections of **Vaccine,** if regularly carried out, produce permanent improvement. An irregular or small number of injections were apparently followed by marked improvement. Each c.c. of vaccine contained 100,000,000 bacteria, and the dose varied from ·1 c.c. to 1·5 c.c.

Ponher advises rising doses of **Potassium Iodide** to increase the fluidity of the nasal secretions.

Adenoids.—Rettere[7] and Lelievre think these begin as a hyperplasia of the elementary epithelium, followed by a metamorphosis of the epithelial mass into diffuse or circumscribed connective tissue follicles. Guthrie[8] claims recurrence of adenoids is due to the growth of a piece of tissue left at the time of the first operation. Recurrence is most frequent in children under four years of age, in children subjected to measles and whooping-cough soon after the adenoid operation, and in those who have anterior nasal obstruction, high-arched palates, and narrow nasal cavities which do not permit free nasal respiration after the operation. There is always recurrence in congenital syphilitics. Siebenmann and Blitz[9] tested one hundred and twenty adenoid children for tuberculosis by von Pirquet's method, with forty-seven positive reactions. Ten of the removed adenoids were subjected to histological examination, with negative findings as to tuberculosis. Twenty-five adenoids were still further treated by methods favourable to the development of tuberculous bacilli, and then

examined, with negative results. This study did not show any connection between adenoids and primary latent tuberculosis.

Nasal Neuroses.—Griffin[10] gives the results in fifty-two cases of asthma in which some form of nasal operation had been done with the hope of obtaining permanent relief. Fifty-seven per cent were improved, and 10 per cent cured. In 33 per cent the general health was improved ; twenty-four out of thirty-one complaining of headache were relieved. Bryant[11] considers the asthmatic neurosis to be due to hyperæsthesia of the mucous membrane of the upper air-tracts, and deficiency of inhibitory power in the nerve centres. Comby,[12] after a study of seventy-five cases of asthma in children, does not think that nasal catarrh or adenoids are etiological factors.

Submucous Resection of the Nasal Septum.—For *anæsthetic*, Sobotky[13] applies a weak 2 to 4 per cent cocaine solution to either side of the septum, and usually injects 10 c.c. of a sterile normal salt solution to which are added 4 min. of 1–1000 adrenalin chloride. Jones[14] injects a $\frac{1}{5}$ per cent solution of cocaine hydrochloride in normal saline, to which are added 2 drops of adrenalin chloride (1–1000) to the c.c. The syringe used has a capacity of 1 c.c. and has two needles, a long and a short, with tapering barrels. The first syringeful is injected into the upper and posterior part of the septum under the mucoperiosteum covering the bone, near the nasopalatine nerve ; the second into the anterior and upper part of the septum, in the neighbourhood of the internal twig of the nasal branch of the ophthalmic nerve ; the third is divided between the line of incision and the septum near the floor, especially where the anterior palatine canal emerges. After the injection certain circulatory disturbances are evident, such as blanching of the skin, increased pulsation, intense perspiration, pain in the back and abdomen due to pulsation of the abdominal aorta, and headaches. These are probably caused by the action of the adrenalin in raising the peripheral pressure and stimulating the heart. The increased pulsation usually lessens with each injection after the first. Sometimes fifteen or twenty minutes afterwards there is a reactionary fall of blood-pressure, due possibly to the late absorption of cocaine. This never interrupts the operation if the patient is supine on the table.

To avoid these circulatory disturbances, grating of the bone, and headaches, he operates in nervous and timid patients under a general and local anæsthesia combined. His general anæsthesia consists of 1 part chloroform and 2 parts ether, and when the patient is barely unconscious, half a syringeful of the same solution used for local anæsthesia is injected into the posterior part of the septum. Great care should be taken in anæmic patients with feeble pulse, and if there is great pallor, and no increase in the pulse tension or the strength of the heart's beat, the injection must be discontinued. Richardson[15] thinks general anæsthesia is preferable to local, since shock is much less, pain is absolutely annihilated, and the nervous susceptibility of the patient is less disturbed.

Wood[16] finds the operation of value whenever the deviation causes

such symptoms as headache, deafness, and laryngeal troubles. He makes the incision well forward, just within the mucocutaneous junction on the convex side of the deviation, and only includes the mucous membrane on that side. If made too far in, a projecting piece of cartilage may be left which will block the air-current. In cases of prominent spine or crescent, the incision is carried a short distance along the floor of the nose. If there is a web-like formation at the junction of the skin of the vestibule with the mucous membrane, it is incised and separated before making the primary incision. Before attempting separation, the mucoperichondrium is cut through, thus going beneath it and making separation easy. When the mucous membrane has become adherent through being nipped in an injured cartilage, " buttonholing " is unavoidable. Where the cartilage is partly ossified, it is best removed by septal punch forceps. If the deviation is high up, bordering on the bridge of the nose, care is taken not to remove too much, lest the shape of the nose on the outside be endangered, but if a projecting piece is left, it has the effect of throwing the detached mucous membrane out, and preventing its proper apposition with that of the opposite side. When dealing with thickenings and spurs situated posteriorly, it is possible that there may be accessory air-cells, sphenovomerine bullæ, which are best let alone. If these bullæ are unintentionally opened, there is a possibility of sepsis spreading to the sphenoidal sinus. The sphenovomerine bulla appears to be a prolongation forward of the sphenoidal sinus, between the bony layers of the vomer at its junction with the sphenoid.

The author reports one hundred cases among which there were various bad complications, such as hæmatoma of the septum, hæmorrhage, synechia, toothache, acute otitis media requiring incision of the drum, acute frontal sinusitis, and tonsillitis, due to plugging. Perforations occurred in a few cases. Should they prove troublesome he advises enlarging, as a large perforation never causes trouble, while a small one may. [Plugging should not be tight, and should all be removed within six hours. Rubber sponge makes good packing material.—G. L. R.]

McKenzie[17] often performs submucous resection for secondary reasons, as well as for the primary cause, nasal obstruction. The operation has been beneficial in cases of chronic laryngeal catarrh, laryngeal tuberculosis, chronic catarrhal deafness, unilateral atrophic rhinitis affecting the widely patent side, diseased sinuses, asthma, and severe headaches.

MacWhinnie[18] prefers the vertical incision to the L flap, and makes it about 4 mm. from the anterior end of the cartilage, except in cases where the alæ of the nares recede, when it is made 2 mm. posterior to a vertical line coincident with their external margin. With one sweep of the knife the incision includes the mucoperichondrium and cartilage. The edges of the mucous membrane and perichondrium are elevated the entire distance of the perpendicular plate. Kerr,[19] after doing a submucous resection, replaced a piece of the cartilage at a

point where a perforation was imminent, and thus repaired it in ten days; seven months later the mucous membrane presented a healthy appearance.

Kanter,[20] in comparison with the various operations for septal spurs, finds submucous resection by means of the chisel the most successful. Under local anæsthesia an incision is made in the mucous membrane and perichondrium down to the cartilage, anterior to the spur, after the method of Hajek or Killian. With a dull elevator, the mucoperichondrium, with the periosteum, is detached from the septum for about one inch, and this is continued until the mucoperichondrium and periosteum are completely separated from the spur. Then, with a nasal chisel having a curved cutting edge, the spur is chiselled off with a few gentle taps of the mallet, leaving a concavity in its stead, care being taken not to perforate the septum.

Alexander[21] reports several *complications* after submucous resection operations. He cites a case of severe hæmorrhage due to laceration of the artery of the septum. A man, fifty-five years of age, was operated upon for a deflected septum. When the operator attempted to remove the posterior septum, the patient bled so profusely before the tampon could be applied, and lost so much blood, that he was obliged to remain in the hospital suffering from intermittent hæmorrhage. Later he developed a mastoid abscess, due either to blood trickling into the Eustachian tube or to inflammation of the Eustachian tube by the posterior tampons. In other instances, secondary hæmorrhages are caused by the too early removal of the intranasal packings, or a hæmatoma may be the result of a too early or involuntary removal of these dressings. Mild types of infection, such as sore throat, amygdalitis, stiffness of the neck muscles, with headache, combined with general malaise, are most frequently due to the absorption of septic material from intranasal tampons, and yield quite readily to treatment. Acute otitis media, either catarrhal or purulent, and acute mastoiditis are not infrequent complications. Severe infections, such as meningitis, abscess of the septum, and septicæmia, are of very rare occurrence. These facts should make one careful in the selection of cases, and in the operation no undue traumatism should take place. Complications may arise in the most simple cases.

Nasal Deformities.—Hayes[22] describes the transplantation of a piece of rib in correcting a " saddle-back " nose. (*See also* MEDICAL ANNUAL, 1912.) Mackenty,[23] in operating for *septal deformities in children*, takes great care to remove only sufficient cartilage or bone to allow the remainder to fit into the nasal frame without overlapping or crowding. The mucous membrane must be left, and the cartilage maintained perfectly straight with as little splinting as possible. In children under twelve, general anæsthesia is given. An incision is made well in front of the deformity, beginning as high as possible on the septal side, and extending down and across the floor to the external nasal wall. The mucous membrane is elevated all over the face of the deformity, and well behind and above it. The cartilage is then incised to the

mucous membrane of the other side, from before backward, the whole length of the deformity, and at an elevation of $\frac{1}{4}$ to $\frac{1}{3}$ in. from the nasal floor. This strip of cartilage is removed flush with the floor, taking with it the intermaxillary spine. Care is taken not to separate the mucous membrane from the remaining cartilage on the opposite side. An angular knife is introduced under the mucous membrane flap to a point behind the deformity (proximal side), and an incision is made extending upward to the junction of the cartilage with the nasal bones, then forward along the upper border of the deformity to the tip of the nose. The incision goes to and not through the mucous membrane on the opposite side. When this incision is made above and behind the mucous membrane flap, as may sometimes be necessary, cutting through the mucosa and cartilage on the proximal side wall behind and above the farthest point of denudation, the flap receives its blood supply from the floor where it is attached. The separated plate of cartilage is now moved over to the median line, swinging upon its upper hinge, the lower margin approximating to the floor and filling the space from which the strip of cartilage has been removed. When the surface of the loosened cartilage occupies two or more planes when brought to the centre, and does not form a perfect plane with the septum behind, incisions are made at the junctions of these planes through the cartilage to the mucous membrane of the opposite side. This divides the cartilage into two or more pieces, which can be adjusted to one plane in the central line. It may be thinned by shaving. The original incision in the mucous membrane is stitched, and splints are worn for four or five days. When the deformity involves the bony septum, it is generally in the shape of a ridge or angular deviation extending upward and backward. To remedy this, a small hole is made in the cartilage where it joins the bone. A mucous membrane elevator is introduced into the opening to the distal side, and separates the mucosa from the concavity of the ridge. On the proximal side, the mucous membrane is also elevated from the convexity of the ridge. The strip of bone thus exposed is removed. Then with flat bone forceps the upper and lower segments are broken over to the centre line. Their convergence fills in the space formerly occupied by the removed bone.

Tuberculosis.—Wright[24] finds that 75 per cent of nasal tuberculosis assumes the nature and character of lupus. Tuberculosis of the nasal septum occasionally forms deep ulcerations and masses of granulation tissues. He cites two cases of ulceration of the posterior septum.

Bacteriology.—Turner[25] presents the results of a personal and general study of the spread of bacterial infections from the nasal and nasopharyngeal cavities by way of lymphatic channels. A variety of organisms may be found in the healthy nasal and post-nasal cavities of most individuals, which, while usually quiescent or avirulent, may from divers factors which diminish tissue resistance, give rise to acute infections. As to the relation of the nasal and post-nasal cavities to the cerebrospinal meninges, the mode of infection is almost impossible to find. He considers that conclusive proof of intracranial infection by

pyogenic organisms from the nose by way of lymphatic vessels, requires more direct evidence than has yet been obtained. On the other hand, in acute poliomyelitis, theoretical and experimental evidence seems to establish the nasomeningeal route as the direct one for infection. As a whole, however, the part hitherto assigned to the lymphatic vessels in carrying infection from the upper air-passages to the cerebrospinal cavities is hardly justified by anatomical facts as at present known. In most cases of chronic nasal suppuration in which an intracranial complication has developed, evidence has been found demonstrating the spread of the infection through the contiguous bony wall. With reference to tuberculous infection of the cervical lymph glands from the nasal and nasopharyngeal mucous membrane, anatomical and clinical evidence demonstrate its possibility though not its frequency, as the disease may exist for years in these situations without any general systemic infection taking place. Of fifty-six cases investigated, pulmonary tuberculosis developed in only two.

The value of **Vaccine** treatment in **Nasal Catarrh** is alluded to at *page* 49.

REFERENCES.—[1]*Thèse de Paris*, 1911 ; [2]*Med. Tyd. v. Geneesk.* 1911, Nov. ; [3]*Pract.* 1911, Nov. ; [4]*Ibid.* 1912, Mar. ; [5]*Ann. Otol.* 1912, Mar. ; [6]*Ibid.* June ; [7]*Soc. de Biol.* 1911, Feb. 11 ; [8]*Lancet*, 1912, Apr. ; [9]*Arch. f. Laryng.* 1911, xxv. 1 ; [10]*Amer. Jour. Med. Sci.* 1911, Dec. ; [11]*Ann. Otol.* 1911, Dec. ; [12]*Arch. de Méd. des Enf.* 1911, Oct. ; [13]*Bost. Med. & Surg. Jour.* 1912, Feb. ; [14]*Brit. Med. Jour.* 1912, Feb. ; [15]*Jour. Amer. Med. Assoc.* 1912, Sept. ; [16]*Brit. Med. Jour.* 1911, Oct. ; [17]*Med. Rec.* 1911, Oct. ; [18]*Laryngoscope*, 1911, Nov. ; [19]*Woman's Med. Jour.* 1911, Jan. ; [20]*N.Y. Med. Jour.* 1911, Oct. ; [21]*Ibid.* ; [22]*Med. Rec.* 1912, June ; [23]*Ibid.* 1911, Nov. ; [24]*Brist. Med.-Chir. Jour.* 1912, Mar. ; [25]*Edin. Med. Jour.* 1911, Nov.

NOSE, HÆMANGIOMA OF. *Priestley Leech, M.D., F.R.C.S.*

Battle[1] reports a case in a man twenty-four years old. The condition (*Plate XX*) was congenital ; he had no pain, but found it difficult to get employment. On more than one occasion he had suffered from hæmorrhage. Battle first ligatured the external carotid, the superior thyroid, and the facial arteries on both sides, and after closing the incisions the whole diseased area of the nose was cut away, leaving only the bony and cartilaginous framework. Four days later electrolysis of some outlying portions of tissue was done ; a fortnight later this was repeated, and the central portion of the lip was excised, with part of the columella nasi. A few days later, a flap of skin was turned down from the forehead after the Indian method, to cover the granulating surface. The result was good.

REFERENCE.—[1]*Lancet*, 1912, i, 784.

OBESITY.

Faradism is said to be of value in the treatment of this condition.

ŒSOPHAGUS, STRICTURE OF. *Priestley Leech, M.D., F.R.C.S.*

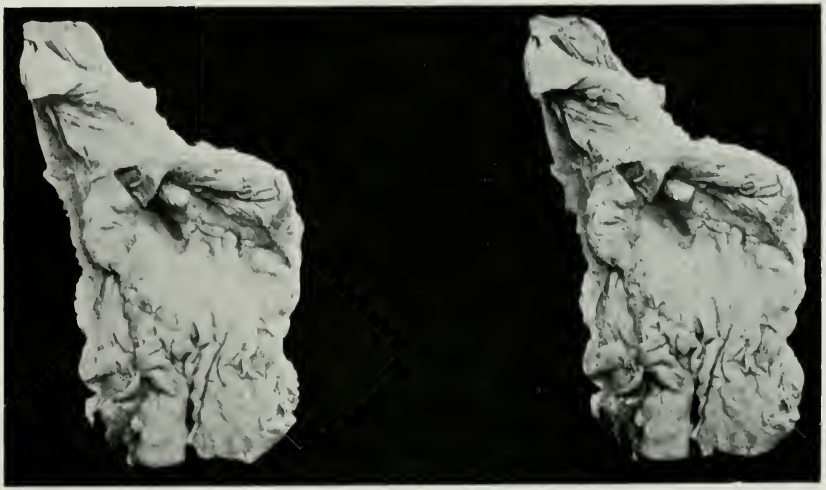
ETIOLOGY.—Walker Downie[1] has analysed 100 cases of stricture of the œsophagus. Contrary to the usual view, the benign stricture is more common and does not become malignant in the course of time.

PLATE XX.

W. H. BATTLE'S CASE OF HÆMANGIOMA

PLATE XXI.

STRICTURE OF THE ŒSOPHAGUS



Bristol General Hospital, No. 3309 *Photograph, Geo. Scott Williamson, Pathologist*

(A dental plate was impacted in the dilated lower part)

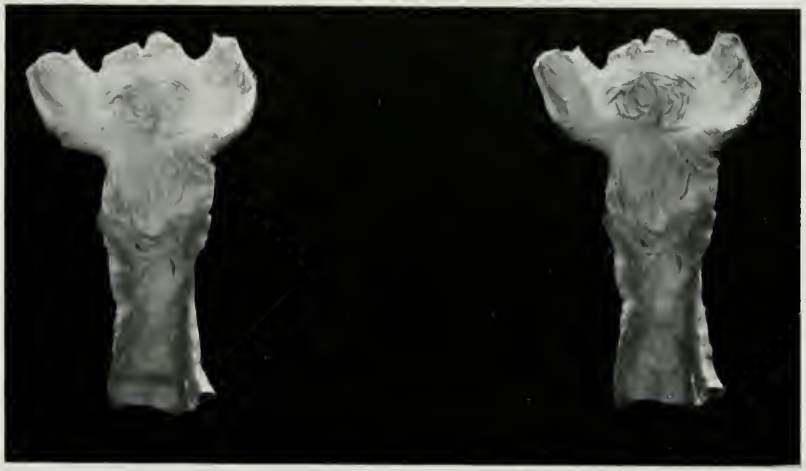
PLATE XXII.

ANNULAR STRICTURE OF THE ŒSOPHAGUS (CARCINOMA)

Bristol General Hospital, No. 3302 *Photograph, Geo. Scott Williamson, Pathologist*

PLATE XXIII.

STRICTURE OF THE ŒSOPHAGUS (EPITHELIOMA)



Bristol General Hospital, No. 3311 *Photograph, Geo. Scott Williamson, Pathologist*

PLATE XXIV.

STRICTURE OF THE ŒSOPHAGUS (EPITHELIOMA)

Bristol General Hospital, No. 3305, 3306 *Photograph, Geo. Scott Williamson, Pathologist*

Benign strictures formed seventy-two out of the 100 cases. They may be classified as follows :—

(1). *Congenital* narrow œsophagus. The constriction is generally in the mouth of the gullet. Three cases were of this character. It may only give trouble when the patient takes food hurriedly or carelessly. There is also a congenital stenosis with no trace of fibrosis, annular or fusiform in shape, limited to the mucous and submucous coats alone, and usually found in the upper part of the œsophagus.

(2). *Spasmodic Strictures.*—Twenty-four per cent were of this nature. Five occurred in men of an average age of fifty years, and nineteen in women of an average age of thirty-six. It may be a motor neurosis pure and simple, or may be dependent on some organic lesion. The usual site is the cardiac end of the stomach.

(3). *Cicatricial and Fibrous Stenosis* (*Plate XXI*).—These have their origin in some form of inflammation, ulceration, or injury. There were twenty-five cases ; nine in men of an average age of 42, and sixteen in women of an average age of 39. The usual cause is corrosive poisoning, most often by liquid ammonia. Even when the mouth and fauces heal without scarring, serious cicatricial changes very frequently occur within the gullet, and it is wise to give a guarded prognosis even if the injury to the upper part appear trifling. In every case of this kind seen by Downie, there have been at least two distinct and separate strictures, corresponding to the natural narrowings of the tube ; one close to the mouth of the gullet, and a second at a variable but distinctly lower level, usually close to the cardiac end of the œsophagus. If there be a third, it is at about the level of the bifurcation of the trachea. *Syphilis* is another cause of stricture of the gullet. Of Downie's 100 cases, nine were undoubtedly syphilitic. Out of eleven cases he has seen, nine were in women. He explains this by saying that in married women who are syphilized by their husbands, the disease gets a firm hold before any treatment is instituted. In twenty cases of the 100 coming under the heading of *fibrous stricture,* no cause was known to the patient.

Malignant Strictures (*Plates XXII to XXIV*).—Twenty-eight per cent were malignant, 13 per cent in men and 15 per cent in women. When stenosis of the gullet is due to cancer, it is almost invariably primary ; in a few cases the gullet is implicated by extension of the disease from the stomach. The cancers are usually epitheliomata, though adenocarcinoma may be found. It usually occurs between the ages of fifty and sixty.

Diagnosis.—In the spasmodic form, age, sex, temperament, and the variability of the symptoms, are of importance. The bougie, at first grasped tightly, can, if left, be pressed gently onwards when the spasm is over. In cicatricial stricture, there is a history of injury or syphilis. In fibrous strictures, there may at first be considerable room for doubt as to whether the condition is one of simple fibrosis, or the early stage of a malignant process. Here the element of time is of great importance ; in malignant cases the dysphagia is recent, increases

appreciably within a comparatively short time, and is accompanied by very evident emaciation. " If there is a steady loss of flesh with increasing dysphagia in a middle-aged or elderly person, suspect carcinoma ; if the sound is arrested, the diagnosis is very probable ; if there is slight bleeding with the use of the sound, it is all but certain."

Prognosis.—Spasmodic cases are usually amenable to treatment, though there may be periodic relapses ; cicatricial cases, if treated early, may be virtually cured or so greatly relieved that the patient can take food without difficulty. In malignant disease, the prognosis is bad.

Treatment.—In *spasmodic* stricture, it is important to look after the general health ; cold food and acid fluids should be avoided, and the use of alcohol in men and excessive tea drinking in women prohibited. Local exciting causes, (e.g., tonsils, uvula, inflammation of mouth of gullet) should be searched for. **Bromides** and **Valerian** may be given, and where there is evident difficulty in swallowing, **Bougies** should be passed, beginning with a large size.

For the *fibrous* type, **Bougies** must be used, keeping in the largest size that can be passed for ten minutes every alternate day. **Fibrolysin** injections seem to have been of use in some cases. If of *syphilitic* origin, **Specific Treatment** must be given in addition to progressive dilatation by bougies.

Excision of a simple stricture close to the upper end of the gullet should be done only when the obstruction is extreme and the stricture of very limited extent. If the nutrition of the body is interfered with, **Gastrostomy** may be performed, but it is seldom called for. Downie did it in only one out of twenty-five cases. In America, a string is passed through by a gastrostomy opening, and the stricture divided by a see-saw motion.

In *malignant stenosis*, treatment, in the majority of cases, is palliative only. In these cases bougies must not be used. **Symond's Tubes** are useful. **Gastrostomy** may be done. Of those in private practice on whom gastrostomy was performed, the average length of life was a little over five months. **Radium** may help to heal the surface, but the disease spreads in other directions.

Reference.—[1]*Glasg. Med. Jour.* 1912, i, 386.

OMENTUM.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Functions.—Wilkie[1] undertook a series of experiments with the object of elucidating the functions of the omentum. The first point to be investigated was its function under normal conditions. He was able to show that the omentum has a definite, but not great, power of absorbing fluid.

The capacity of the omentum for gathering up solid particles (bacteria, charcoal) from the peritoneal cavity is also easy of demonstration. This function is turned to good account when the peritoneum is invaded by micro-organisms, for upon the vascular omentum the

polymorphonuclear leucocytes are better able to destroy the invaders than when suspended in the peritoneal fluid. A valuable adaptation of its function is seen in the case of an inflammatory focus or injury affecting one of the abdominal viscera within its range. Such lesions become shut off or encapsulated by the omentum; a process which, according to Wilkie, is not a matter of minutes but of hours or days.

These functions may be utilized by the surgeon. A piece of intestine whose blood-supply is compromised, may be preserved by wrapping it in omentum; a perforation of stomach or intestine may be closed by suturing omentum over the defect.

Torsion.—Corlette[2] records two cases of torsion of the omentum apart from its commonest accompaniment, namely, hernia. In neither case were there any old adhesions to account for the torsion, though one patient had been operated upon for inguinal hernia four years previously. In each the onset was marked by sudden acute abdominal pain which afterwards subsided to a dull ache. Examination showed tenderness and resistance in the right lower abdomen, while in one case a large tender mass developed above Poupart's ligament. The first case recovered after removal of the twisted omentum. The other patient died with symptoms of intestinal obstruction three days after the operation.

References.—[1]*Brit. Med. Jour.* 1911, ii, 1103; [2]*Austral. Med. Gaz.* 1912, i, 453.

OPERATIONS, PREVENTION OF SEQUELÆ OF.

Priestley Leech, M.D., F.R.C.S.

Crile[1] has a very stimulating paper on newer methods of increasing the safety of surgical operations. These he divides into two classes, viz., those performed on patients in fair general health, and those performed for injury or disease. In the former class there was one death in 375 operations in Crile's list, so that here there is little immediate risk; but while this risk is slight, such operations still bear a certain stigma in that they are apt to be followed by temporary nervous impairment. Indeed, it is an unpleasant surprise to realize to what an extent the public has come to expect that a number of months will be required for complete nervous recovery from the effects of even a simple operation. This does not apply to all types of patients; there is a vast difference between the woman accustomed to hardships, and one whose nervous reactions have been heightened by training and education, and who may require a year or more for her recovery from an operation or a confinement. He thinks there is a physical basis for these consequences, and that the surgeon may avoid them.

There are, secondly, those whose chances are impaired by acute infections, hæmorrhages, fractures of the skull, penetrating shot wounds, acute intestinal obstruction, etc. All these surgical risks resemble one another in one important particular — they involve an impairment of the patient's vitality. Now the source of the

vital force lies in the cells of the central nervous system, and here are found the physical changes responsible for the decrease in the vital force. Crile and his associates have shown that in anæmia from hæmorrhage, in physical injury, in pyogenic infection, in certain drug poisons, in fatigue, in the primitive emotions and in exophthalmic goitre there are changes in the nerve cells. The leading factors in the technique of a surgical operation that may further impair the brain cells and thus prove "the last straw," are: fear, traumatic impulses set up in the course of the operation, and the impairment of the immunity of the patient by *ether* anæsthesia. In some cases of acute infection the impairment of the immunity by ether alone, without any operative procedure, might easily dispatch the patient.

The ravages of *fear* can be avoided by a combination of special consideration on the part of the nursing and operating staff, and by the preliminary administration in suitable cases of small doses of **Morphine** and **Scopolamine.** To require an unprotected patient to stare death in the face at the time of an operation is comparable to inspection of a photographic film in the sunlight, expecting to find it useful afterwards; under morphine and scopolamine the patient is neither brave nor cowardly, but in a neutral state, because these drugs depress the associational powers of the brain. In external operations the damaging afferent impulses may be blocked, and the brain protected, by the local or intraneural infiltration of **Novocain.** Injurious reduction of immunity in the acute infections may be avoided by the substitution of the innocuous **Nitrous Oxide** for noxious ether. In operations, abdominal and otherwise, in which the afferent impulses from the deeper parts cannot be blocked by local anæsthesia, nitrous oxide as compared with ether anæsthesia confers a high degree of immunity to shock. Under nitrous oxide a patient will endure approximately four times as much operative injury as under ether. In addition, the patient will go to sleep pleasantly instead of under stress, and there will be little or no post-operative nausea. Nitrous oxide acts by reducing the amount of oxygen available for the brain cells, which are thus prevented from being used up rapidly. It has several limitations: it is difficult to administer well; it requires a specially trained anæsthetist; it is more expensive than ether; it does not give so complete a relaxation in abdominal cases, and causes more venous congestion in the operative field. Most of these objections can be overcome or circumvented. In over 20,000 anæsthetics given for dental and surgical work there has been no fatality with nitrous oxide, and in 2,400 of Crile's operations there has been none due to anæsthesia.

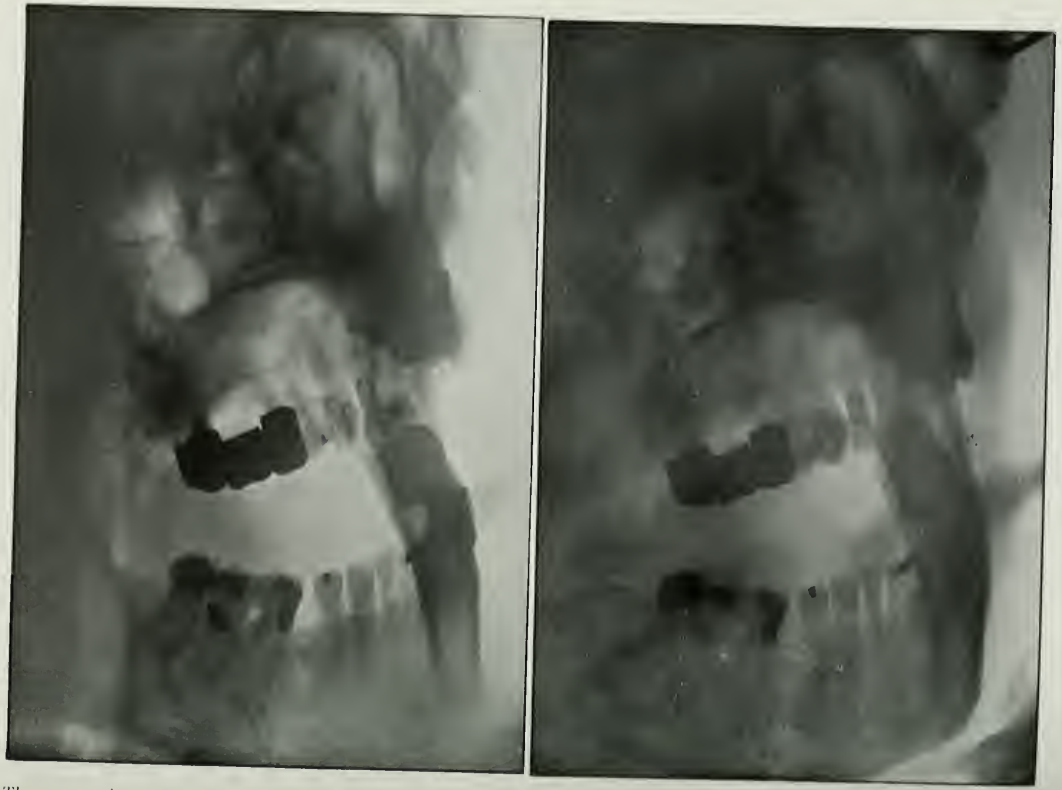
In patients handicapped by starvation or by hæmorrhage, further experience has amply confirmed observations heretofore reported, viz., that by a preliminary or simultaneous **Transfusion of Human Blood** these desperate cases may be converted into safe ones.

Pituitrin found useful in post-operative cases (*see page* 33).

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1811.

PLATE XXV

CASE OF TOXÆMIA DUE TO SEPTIC TEETH—RIGHT SIDE



The same patient as XXVI.

Radiograph, Charles A. Clark

PLATE XXVI

CASE OF TOXÆMIA DUE TO SEPTIC TEETH LEFT SIDE

The same patient as XXV.

Radiograph, Charles A. Clark

PLATE XXVII.

CASE OF IMPACTED THIRD MOLAR WITH ABSCESS AT THE ROOTS

Radiograph, Charles A Clark

PLATE XXVIII.

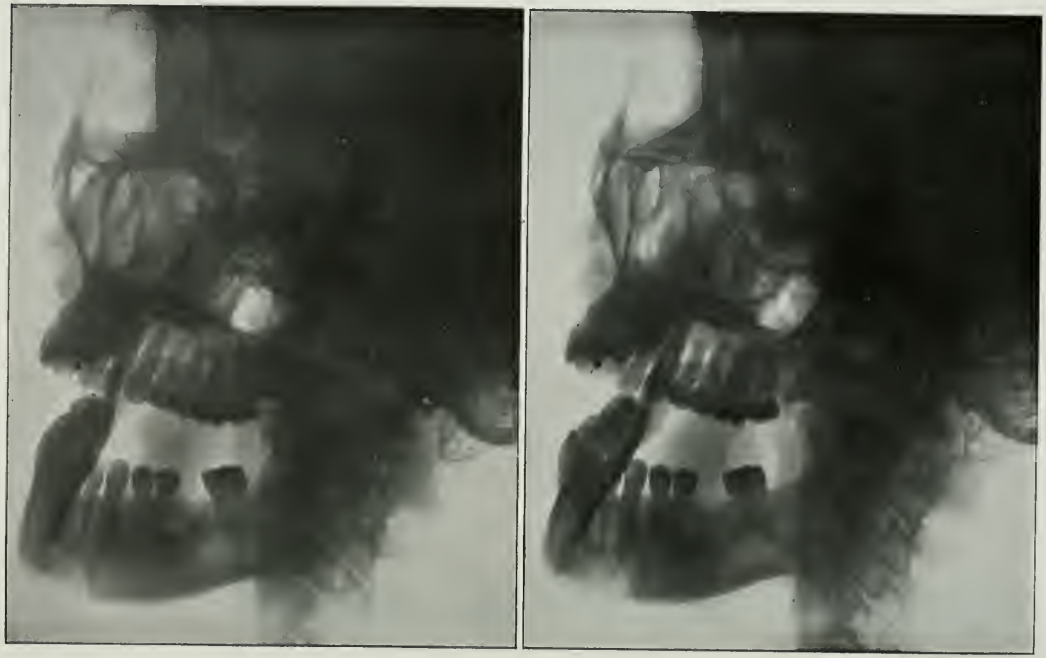
CASE OF PYORRHŒA ALVEOLARIS — RIGHT SIDE

The same patient as XXIX.

Radiograph, Charles A. Clark

PLATE XXIX.

CASE OF PYORRHŒA ALVEOLARIS—LEFT SIDE



The same patient as XXVIII.

Radiograph, Charles A. Clark

PLATE XXX.

ILLUSTRATING A SEVERE CASE OF PYORRHŒA ALVEOLARIS

Fig. A.

Fig. B.

Fig. C.

Fig. D.

Fig. E.

Fig. F.

Fig. G.

Fig. H.

Radiograph, Charles A. Clark

ORAL SEPSIS, X-RAYS IN DIAGNOSIS OF. *Charles A. Clark, L.D.S.*

The important part that oral sepsis plays in disease is admitted on all sides by both physicians and surgeons. At the present day the physician requires the mouth and teeth to be placed in a hygienic condition as one of the most essential matters, should he be treating gastro-intestinal trouble, or general disorders such as rheumatism, possibly also gout, neurasthenia, neuralgia, and so on. No surgeon would undertake a major operation without first ascertaining the condition of the mouth if opportunity occurs, and improving it as far as possible by removal of all doubtful teeth, roots, etc.

Oral sepsis is a frequent cause of nose, throat, and ear troubles, swollen glands, inflammation of the eyes, acute or chronic. An obstinate case of phlebitis, brought to the notice of the writer, was only cured by ridding the patient's mouth of a filthy bridge—those subtle modern devices for the invitation of sepsis. The writer has had many cases of bridge-work to radiograph, and in all of them has found infection of the roots on which the bridge was fixed, or of the gums, by the ill-fitting gold crowns of the bridge.

Therefore the necessity of correctly diagnosing oral sepsis is absolute. Not only must the condition of the crowns of the teeth be ascertained, but that of the roots, of the fitting of crowns, and last, but by no means least, the extent of pyorrhœa alveolaris. It is frequently found that the usual clinical examination of a mouth is insufficient, as in addition to abscesses, cysts or buried roots may be present which cannot be detected otherwise than by radiographs of the teeth and jaws. By this means, not only is it possible to demonstrate the presence of an abscess, etc., but also of pulp stones in the teeth—a frequent indication of pain. The word "indication" is chosen, as though many look upon them as being the cause of pain about the face, others, probably more correctly, consider them as due to the pain or local irritation. The view taken by some, that they are always due to gout, does not agree with the experience of the writer.

The stereoscopic radiographs (*Plates XXV, XXVI*) are those of a patient who was suffering from toxæmia, and was sent by the physician attending him to a dental surgeon for examination of his mouth. As will be seen by the illustrations, he has several fillings, crowns and bridges, the latter especially being suspiciously septic, as they always are.

The radiograph of the patient's right side (*Plate XXV*) shows the following conditions. In the maxilla there is a bridge fastened to the second molar and second premolar. The crown attaching the bridge to the premolar fits badly at the cervical edge; there is around it some absorption and rarefaction of the alveolus. The first premolar has, as frequently occurs, two roots, and there is also absorption of the alveolus due to pyorrhœa and rarefaction. The canine shows absorption of the alveolus from pyorrhœa, and a thickened periodontal membrane, chiefly about its apical portion. The lateral incisor is affected by pyorrhœa, and there is also an abscess at the apex. Owing

to the curvature of the jaw, the central incisor is insufficiently shown for the condition to be observed.

In the mandible, the anterior root of the wisdom tooth has a thickened periodontal membrane about the apex ; it is also exostosed. The first molar has a distal-cervical cavity, while between it and the first premolar is a deeply buried and septic root of the second premolar. In the first premolar and canine not much that is abnormal can be discovered, but the lateral and central incisors are affected by so-called erosion.

The radiograph of the left side of the patient's mouth (*Plate XXVI*) shows that the upper wisdom tooth and the second molar are badly affected by pyorrhœa, the absorption (pockets) being worse on the buccal sides. The first molar has abscesses at each of its three roots, with absorption from pyorrhœa also on the buccal aspect. The second premolar is also seriously affected by pyorrhœa. The first premolar has a large abscess cavity involving the distal side of the canine root. The second incisor shows rarefaction of the alveolus, while the central incisor is insufficiently displayed owing to the curvature of the jaw.

In the mandible, the wisdom tooth is absent, and the second molar has a pyorrhœa pocket on the distal side. On the first molar the bridge is fixed by a gold crown which fits badly, and it is also affected by pyorrhœa. The first premolar also has a badly-fitting crown for the bridge ; the apex of the premolar root is atrophied. The canine and lateral carry the bridge stay.

How could such a condition be accurately diagnosed without the use of the *x*-rays ? Can anything more vexing for a patient be conceived, after spending many weary hours in the dental chair to preserve his teeth and his health, than to find subsequently that it would have been better to have lost them than to have had bridges fixed which have only accelerated a pyorrhœa the cause of which is unknown ! This patient is at the time of writing still under dental treatment, but he has greatly improved since the removal of the bridges and some of the teeth. It is very inadvisable to do many extractions at one time in these cases.

Impacted third molars frequently become inflamed, with formation of abscesses. In *Plate XXVII* a case is illustrated where the patient was suffering much pain about the left side of the face. Attempts to remove this tooth under general anæsthesia, before the radiographs were taken, were quite futile, only resulting, in fact, in the fracture of a large portion of the crown. The radiographs show the tooth lying in an almost horizontal position. The crown is in the horizontal ramus, while the whole of the roots are in the ascending ramus. It is also quite evident that its extraction without the previous extraction of the second molar is not possible. The light area at the apices of the roots shows the abscess. Extraction of both teeth has now been effected, with the result that all the neuralgia and general symptoms have cleared up.

At the present day probably the most fruitful source of oral sepsis is the disease known as periodontal disease, pyorrhœa alveolaris, or Riggs' disease. In fact, it might be looked upon as the twentieth century scourge, as apparently everybody has it in some part of the mouth in a greater or less degree, and unfortunately the majority are not aware of it until its ravages have affected the general health, when it is often too late to save the teeth. This disease is by no means limited to those with unclean mouths, but on the contrary is just as often seen with those who are, and always have been, scrupulously careful in cleaning their teeth daily. *Plates XXVIII, XXIX*, are radiographs from a case illustrating this point. The patient has a particularly clean and well cared-for mouth, and the radiograph in *Plate XXVIII* shows a fairly normal condition of the gums and alveolus; but that of the left side, *Plate XXIX* shows loss of alveolus in the mandible extending from the second premolar to the central incisor, the loss being on the lingual side of the teeth, a wholly unsuspected condition, the gums and teeth being of a good colour.

Radiographs are absolutely necessary to a full and correct diagnosis of the condition of the mouth, a fact admitted by all those who have given this disease special attention. A single plate negative is of very little use: if the jaws are *x*-rayed with plates, these should be used stereoscopically. The best method of radiographing periodontal cases, in the opinion of the writer, is by taking a series of films all around the mouth, as by so doing it is possible to show better the interstices of the teeth, where the disease is usually worst, as well as to obtain finer detail; whereas with stereoscopic radiographs it is not always possible to obtain an uninterrupted view of the whole side when taken laterally.

In *Plate XXX, Figs. A, B, C, D, E, F, G, H*, are shown film radiographs of a very bad case of pyorrhœa, the patient suffering from rheumatism and "nerves." The proper remedy for such a case is extraction of all the teeth, that being the only known cure at the present day, although there are less severe cases when less drastic treatment will mitigate the condition, though never curing it.

Fig. A is a radiograph of the upper right canine region. The first premolar has a deep pocket, the alveolus being absorbed over fully two thirds of the root. The canine has also an equally deep pocket on the distal side, but not so deep on the mesial. The alveolus between the lateral and canine shows marked rarefying osteitis, the root of the former being almost denuded of bone. On the canine is a fragment of tartar, which is invariably found on the roots in these cases. *Fig. b*, a radiograph of the incisor region (upper), shows that the central incisor has on the mesial aspect a pocket extending almost to the apex; the gum, extending up to the cervical edge of the tooth, being shown by a very faint shadow between the two incisors. Situated above the apex of the left central incisor is a space indicating a considerable loss of bony tissue. The left central is denuded of bone more than half-

way up the root. Between the left central and lateral incisors there is a deep pocket on one, probably the lingual, side of the tooth. Pus comes freely from all these teeth.

Fig. C is of the left lateral and canine. It shows complete destuction of bone up a considerable portion of both teeth. There is also rarefying osteitis. The canine has a thickened periodontal membrane, and the apex is partly absorbed. The jaw line is seen better in this than in the previous ones.

Fig. D, illustrates the mandibular right molar region. The loss of bone between the wisdom tooth and second molar is almost complete, while the posterior root of the first molar has no bony attachment whatever ; there is much absorption between the posterior and anterior roots, the latter being surrounded by rarefaction. Between the first molar and second premolar is much loss of bone, but not so much on the mesial side of the premolar, where a small mass of tartar is shown below the gum margin.

Fig. E portrays the mandibular right canine and incisor region, and shows that the canine and the lateral and central incisors have the alveolus absorbed for about three-quarters of their length. The periodontal membrane of each is also much thickened.

Fig. F shows the amount of destruction in the whole of the incisor region, while on the mesial side of the right central, tartar is again shown below the gum margin.

Fig. G is a radiograph of the left canine, the pocket surrounding which is not so deep as the one already mentioned.

Fig. H demonstrates the two premolars, first molar, and wisdom tooth ; the latter has tilted forward through loss of the second molar. The first premolar has a deep pocket an the buccal side, but not so deep on the lingual. It has also a metal filling, the cervical edge of which projects beyond the tooth and forms a place where micro-organisms can collect. The second premolar has also a deep pocket similar to the first. The first molar is in a very bad condition, the anterior root being almost denuded of bone, while the posterior root is completely isolated from the socket. The gum line is shown to be fairly well up to the necks of the teeth.

Pus comes from all these teeth. Probing does not always discover the depth of the pockets, but the *x*-rays do.

On *page* 72 **Zinc Ionization** is recommended in the treatment.

ORBITAL CELLULITIS.

(*Vol.* 1912, *p.* 418)—Early and free **Incision** is essential. Unless pus is actually pointing, it is safer to make an exploratory incision from the outer side.

ORCHITIS.

Urotropin used in (*page* 16). (*See also* EPIDIDYMITIS).

OS CALCIS, EXOSTOSES OF.

(*Vol.* 1912, *p.* 419)—It is best to chisel away the outgrowth ; but if this be impracticable, relief may be afforded by cushioning the inner aspect of the heel, in a manner fully described in the text.

OSTEOMALACIA.

(*Vol.* 1912, *p.* 34)—**Pituitary Extract** was administered by Bab, the results being variable; in one case complete cure is claimed.

OSTEOMYELITIS. *Priestley Leech, M.D., F.R.C.S.*

Dawbarn[1] records a method of treatment of osteomyelitis which is perhaps novel. In the case of the long bones, e.g., the femur, the marrow is exposed at one end of the bone, below the lesser trochanter, and then above the condyle. A coarse silver wire with a tiny loop at the end is passed in at one hole, through the canal of the bone, and out at the other end; a stout fish-line is attached to the loop of the wire and pulled through the medullary canal. To the middle of the fish-line is fastened a tightly rolled gauze sponge, of a size to fit comfortably the medullary canal, and by pulling this backwards and forwards he cleans out the canal. He thinks this is better than curetting the marrow in cases where it is needed. He then fills the canal with Beck's paste.

Reference.—[1]*Ann. Surg.* 1912, i, 106.

OVARY, DISEASES OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Hæmorrhage from the Follicle.—Primrose[1] has met with two cases, both requiring an abdominal section. The blood in each case came from a Graafian follicle, which had reached maturation and escaped into the peritoneal cavity. In one case acute appendicitis was associated, and the inflammatory reaction in the neighbourhood may have had something to do with the failure of the follicle to become sealed after escape of the ovum. In the other case, the accident was attributed to the strain of lifting a heavy weight. These cases, together with others recorded in the last few years, demonstrate that hæmorrhage into the peritoneal cavity from this source is by no means rare. The symptoms closely resemble those of ruptured or leaking extra-uterine gestation, except that there is rarely a period of amenorrhœa; but abdominal pain, tenderness over the hypogastrium, and vomiting are frequently present.

The Treatment is **Laparotomy,** and removal of the follicle.

Hæmorrhagic Ovarian Cysts.—Goinard and Laffont[2] describe the presence of a pelvic tumour, displacing the uterus to one side and causing pain and vomiting. Mériel[3] records a case of a hæmorrhagic ovarian cyst in a girl whose periods were in abeyance during the time that the cyst was present. The removal of the tumour by laparotomy resulted in the regular onset of menstruation.

Transplanted Ovaries.—Kawasoye[4] has transplanted ovaries in the rabbit, and finds that even under the most suitable conditions degeneration and atrophy follow, from diminution of blood-supply. He argues that in removal of diseased appendages the whole ovary, or as much as possible, should be left *in situ*, and the blood-supply guarded from injury.

Martin[5] sums up the present position of our knowledge, in that auto-transplantation of ovaries can be successfully performed, but requires a vascular bed, such as the broad ligament, uterine horn, peritoneum, or muscles, and such grafts prevent the onset of artificial menopause symptoms; hetero-transplantation is not so successful, but close consanguinity between the subjects increases the chance of success.

References.—[1]*Ann. Surg.* 1912, ii, 125; [2]*Bull. Soc. d'Obst. & Gyn. de Paris*, 1912, Feb.; [3]*Soc. d'Obst. de Toulouse*, 1911, xiii, No. 2; [4]*Zeitschr. f. Geb. u. Gyn.* lxxi, 2; [5]*Surg. Gyn. & Obst.* 1911, July.

PANCREAS, DISEASES OF. *Robert Hutchison, M.D., F.R.C.P.*

Leech,[1] in a careful review of recent attempts to estimate pancreatic activity by clinical tests, arrives at the following conclusions:—The glutoid and salol tests are of little actual value; the nuclear test is doubtful. The presence of voluminous light-coloured stools, undigested meat fibres, and of fat in large quantity, especially of neutral fat, are valuable evidence of pancreatic disease, but of advanced pancreatic disease either actively destructive or blocking the duct, and not of fine changes which frequently cause dyspepsia. The value is enhanced if a Schmidt's diet is given. The unfavourable verdict in numerous recent articles on Cammidge's test is disappointing; the test cannot be said to have fulfilled the hope built up on it. The future of various ferment tests seems good, especially those for amylase and trypsin in the fæces, and perhaps of amylase in the urine. The worth of the tests is all the greater where the value of ferment in urine and fæces can be compared. A large field of work lies open on this subject, but the present clinical value is small. Gross changes alone are indicated; we have yet no sure test for fine pancreatic changes.

Reference.—[1]*Pract.* 1911, ii, 631.

PANCREATITIS. *Sir B. G. A. Moynihan, M.S., F.R.C.S.*
H. Upcott, F.R.C.S.

In a valuable article, Korte[1] says that the different forms of pancreatitis—acute inflammatory, hæmorrhagic, necrotic, purulent—cannot be distinguished clinically, and he thinks they are but stages in one affection. The acute inflammation of the pancreas generally leads rapidly to diffuse hæmorrhage, followed by the death of larger or smaller portions of the gland, this necrosis and the subsequent separation of sequestra being associated with peri-pancreatic suppuration.

Symptoms.—Korte's material consists of 44 cases in which the diagnosis was established by operation or autopsy. Six were considered only from the post-mortem findings, and 38 were operated upon. Of these, the pancreas was directly attacked in 34 (18 recovered and 16 died). The remaining 4 cases, in which only concomitant disease of the gall-passages was treated, died. The histories bring out the facts that attacks of pain, which in character and situation correspond fully to typical gall-stone colic, can be caused by disease of the pancreas;

and that acute inflammation of the head of the pancreas may obstruct the common duct, causing jaundice. The attacks of pain may also be confused with gastric or duodenal ulcer. As a rule, the onset of acute pain, vomiting, and collapse is sudden. Korte considers tenderness and resistance across the middle of the epigastrium valuable signs. In most cases the pre-operative diagnosis is one of probability only, though cases in which, after typical symptoms of epigastric peritonitis, a subsequent inflammatory swelling develops posteriorly, especially in the left lumbar region, may be diagnosed with a fair amount of certainty.

TREATMENT.—Operation was performed upon the 34 cases during the following periods :—

	Recovered	Died	Total
First week ..	8	4	12
Second week ..	3	1	4
Third week ..	4	3	7
Fourth week ..	3	4	7
Fifth week ..	0	4	4
Total ..	18	16	34

The earlier the operation the greater the probability of meeting with the acute stage, while the later the operation the greater the likelihood that necrosis and peripancreatic pus formation will be found. Of 21 cases of acute inflammation without necrosis, 16 recovered and 5 died. Of 13 cases with extensive necrosis of pancreas, 2 recovered and 11 died. Necrosis can occur even as early as the third or fourth day, and these cases have a very bad prognosis. At the same time, Korte feels justified in urging operation at the earliest moment.

The best approach to the gland is through the gastro-colic omentum. If it is in the acute stage before necrotic softening and peripancreatic pus formation, the gland is hard, swollen, and reddened, with spots of fat necrosis scattered about it. The pancreas is best treated by blunt incision and free drainage, so as to supply a free exit in case of subsequent necrosis. Lumbar incision is chiefly indicated in cases of pus formation and necrosis of the left half of the pancreas, particularly if the pus invades the retroperitoneal tissue, and points in the left lumbar region.

Of the cases which have recovered, all save one are in the best of health. This one developed diabetes eighteen months later, and died eight years after the first illness. A very serious post-operative complication is profuse hæmorrhage from the depths of the wound. The bleeding comes from erosion of the splenic or one of the larger arterial branches, and occurs during the stage of pus formation and necrosis. Of 7 cases of hæmorrhage, only one could be saved by gauze packing. Early operation seems to reduce this danger considerably, but only so far as early exposure and drainage of the inflamed gland prevent the subsequent development of necrosis.

It is of interest to compare these results with Mettin's[2] figures. He reports 22 cases of acute pancreatitis treated by operation. Among 15 cases without necrosis (suppurative and hæmorrhagic pancreatitis), there was a mortality of 71 per cent. There were 7 cases operated upon in the stage of necrosis, with a mortality of 66 per cent.

REFERENCES.—[1]*Ann. Surg.* 1912, i, 23; [2]*Deut. Zeits. f. Chir.* 1912, 281.

PANNICULITIS. *Herbert French, M.D., F.R.C.P.*

William Bain[1] gives this name to a condition which he has met with several times in patients who declined to continue massage because of the pain it produced. At first he thought the complaint was neurotic, but later he became convinced that it was due to organic changes in the subcutaneous tissues, allied to, but distinct from, the fibromyositis of Maxwell Telling. On examination it is found that the hyperæsthesia is generally limited in extent and distributed in patches. The patches occur most often on the abdomen, next in order of frequency on the legs, arms, and back, and occasionally on the thorax. If one picks up the skin and subcutaneous tissue over it and rolls them between the fingers, they feel firmer and less elastic than normal. The slight infiltration is either in the deepest layers of the corium, or in the subcutaneous tissue, or in both. Judging by tactile sensation, the inflammatory deposit seems to be in the subcutaneous tissue. The sensitive areas are generally smooth, about 1 or 2 inches in diameter, and very tender on pressure. If the pressure is applied perpendicularly to the surface the tenderness is slight, but if applied from the circumference of the sensitive area it is very marked. A patch is evidently an aggregation of smaller ones. When the patch is disappearing under massage, it splits up into several smaller ones, and the thickening therefore becomes uneven. The contour of the smaller patches can be made out, and before they finally disappear they feel like small pin-heads. Most of the patients are females about the middle period of life, and are inclined to be stout. The pain is evidently produced by the pressure of the inflammatory deposits on the nerve endings. The infiltration occurs in the panniculus adiposus, from which Bain coins his word.

TREATMENT. — Thyroid medication was tried without benefit. **Massage** carried out with special care seems to be the only effective remedy; sometimes the thickening in the panniculus adiposus has to be dispersed carefully in this way before it is possible to massage the underlying muscles.

REFERENCE.—[1]*Lancet*, 1912, i, 363.

PARALYSIS AGITANS.

Luminal (*page* 23) is recommended as a sedative for this condition, and **Combined Glandular Extracts** have also been given (*page* 30).

PARALYSIS, GENERAL. (*See* DEMENTIA PARALYTICA.)

PARALYSIS SUPRASCAPULAR. (*See* SUPRASCAPULAR NERVE.)

PARASITES, INTESTINAL. (*See* WORMS, INTESTINAL.)

PARATYPHOID FEVER. *E. W. Goodall, M.D.*

In the Milroy Lectures for 1912, Bainbridge[1] discusses at length the differentiation between meat poisoning and paratyphoid fever, and their causative organisms.

Of recent years several organisms, more or less closely resembling one another, have been isolated in various outbreaks of disease in men and animals. The best known of these are: *B. enteritidis (Gaertner)*, *B. Aertrycke*, *B. paratyphosus (A)*, *B. paratyphosus (B)*, *B. suipestifer*, *B. psittacosis*, *B. typhosus murium*, *B. morbificans bovis*, *B. icteroides*, and *B. Danysz*. According to the author, all these organisms can be shown to belong to one or other of the following: *B. suipestifer*, *B. enteritidis*, *B. paratyphosus (A)*, and *B. paratyphosus (B)*. These four constitute what is known as the "Salmonella group." *B. Aertrycke* is the same as *B. suipestifer*.

Various attempts have been made to change these organisms one into the other, and Sobernheim and Seligmann claim to have transmuted *B. enteritidis* into *B. suipestifer* in the laboratory, but their observations have not been confirmed. Bainbridge, however, conjectures that "the members of the Salmonella group have arisen by a slow process of evolution from a common ancestor; and the fact that these bacilli as we know them, are usually found in different species of animals, suggests that possibly they have become modified by prolonged existence in animals of a given species."

Paratyphoid (A) Fever (caused by *B. paratyphosus (A)*) occurs in most parts of the world, but apparently more frequently in Asia, (especially India) than in Europe; no case has yet been recorded in the United Kingdom. The bacillus has not been found in healthy men except after an attack of paratyphoid (A) fever, nor (with one exception) in animals, food, or water; it has been found once in acute gastro-enteritis, and twice in the gall-bladder during an operation for gall-stones. The infection is conveyed by human carriers. The incubation period is eight to eighteen days. The symptoms are the same as those of mild enteric fever. The complications are also the same, but less frequent. The fatality is very low, less than 2 per cent.

"The only certain means of diagnosing paratyphoid (A) fever is the isolation of the bacillus from the blood or stools of the patient during life, or from the spleen or other organs after death." Diagnosis by serum reactions is "beset by many sources of error, and needs very careful technique." As in enteric fever, convalescents from the disease may become carriers and be the cause of outbreaks of the disease. There is nothing to show that it is spread by water-supplies or by flies.

Paratyphoid (B) Fever, (caused by *B. paratyphosus (B)*).—Outbreaks have occurred in Germany, France, and America, also in Malta and England; it appears to be rare in India and South Africa. It is so much like enteric fever clinically that it is usually diagnosed as such.

In England about 3 per cent of the cases diagnosed as enteric are usually paratyphoid.

B. paratyphosus (*B*) is very rarely found in man except in patients suffering from paratyphoid (B) fever, or in persons who have recently had an attack of that fever and are acute or chronic carriers. One small outbreak caused by it has been recorded by Bainbridge and Dudfield. It has been on one occasion isolated from the intestines of a fly. The mode of infection and the latent period are as in paratyphoid (A) fever.

Clinically, the disease cannot be distinguished from enteric fever, and the post-mortem appearances in the two diseases are very much alike. The fatality of the recorded cases is about 3 per cent.

The isolation of the specific organism is the only certain means of diagnosing paratyphoid (B) fever. In respect of the serum diagnosis the author writes as follows: "Frequently the patient's serum agglutinates *B. paratyphosus* (*B*) in very high dilution, such as 1–5,000 to 1–20,000, whereas it fails to agglutinate *B. typhosus* in higher dilution than 1–100. A diagnosis of paratyphoid (B) fever may then be regarded as almost certain, even though the bacillus is not isolated. There are, however, cases of enteric fever in which the patient's serum agglutinates *B. paratyphosus* (*B*) in higher dilution than *B. typhosus*. An absolute diagnosis of paratyphoid (B) fever in a given case rests, therefore, upon two pieces of evidence; namely, the presence of the clinical symptoms characteristic of enteric fever, and the isolation of *B. paratyphosus* (*B*) from the patient. Failing the isolation of the bacillus, a probable diagnosis can often be made from the serum reaction of the patient."

Bainbridge has collected and analysed the accounts of 29 carrier cases. He notes two striking facts: the first, that 26 of the carriers were women, and that 7 were suffering from either cholecystitis or gall-stones. In these respects paratyphoid cases very closely resemble chronic typhoid carriers. The author gives instances of outbreaks in which there was evidence for believing that a carrier was the cause. No mode of infection other than by carriers has so far been demonstrated.

Meat-poisoning.—Poisoning by meat may be due to (*a*) ptomaine poisoning, or (*b*) infection with *B. enteritidis* (Gaertner) or *B. suipestifer.*

(*a*). By "*ptomaine*" is meant some chemical substance found in the meat during the process of putrefaction. Bainbridge states, however, that he has been unable to find any instance in which the presence of such substances has been demonstrated in meat which has caused disease. Laboratory animals are much less susceptible than man to these bodies, of which, besides, very little is known. Hence "definite proof that a given case of meat poisoning is caused by ptomaines is very difficult to obtain, and the diagnosis rests mainly on the absence of other possible causes of the illness." In all instances careful bacteriological examination should be made before infection by micro-organisms is excluded.

The principal symptoms of ptomaine poisoning are diarrhœa and vomiting, usually of short duration. Usually, too, the onset of the illness occurs very soon, rarely more than five or six hours after the poisoned food is eaten.

(*b*). But most cases of meat poisoning are due to infection with *B. enteritidis* or *B. suipestifer*. Outbreaks of meat poisoning caused by *B. enteritidis* or *B. suipestifer* have occurred in most European countries and also in America, but they are most frequent in Germany, where much uncooked meat is consumed. They occur chiefly in the summer and autumn, and are more often due to *B. suipestifer* than to *B. enteritidis*.

The incubation period is usually between six and twenty-four hours ; it may be as long as seventy-two hours, or as short as two. Short periods are especially likely to occur in cases where the meat has been consumed several days after it has been infected. " The illness often begins with a severe headache or with a rigor, speedily followed by acute gastro-intestinal disturbance—nausea, diarrhœa, vomiting, abdominal pain. In the more severe cases restlessness, extreme thirst, and nervous symptoms such as cramp, become prominent, and death may be preceded by coma. Fever is usually present, and the temperature may reach 102° to 103° F. As a rule it falls to normal in from two to five days, and the vomiting and diarrhœa cease." An average case lasts about a week, but convalescence is tedious. In a few cases death may result within twenty-four hours. The fatality is from 1·5 to 2 per cent. *B. enteritidis* is rather more deadly than *B. suipestifer*. A post-mortem examination shows swelling and congestion, often intense, of the mucous membrane of the stomach and intestines. The Peyer's patches are not particularly affected ; minute ulcers are occasionally found, but are not confined to any special portion of the alimentary canal. The liver may present fatty changes.

The bacilli can often be isolated in large numbers from the stools of the patient during the actual illness ; but they disappear in a week or ten days from the onset. Post mortem they can be isolated from the heart-blood, and from the spleen and other viscera. A positive serum reaction is usually found in six to eight days after the onset. The bacilli can usually also be detected in the infected meat. Inoculation of animals with the bacilli obtained from the patient or from the meat is of no aid in the diagnosis, as they may be normally present in healthy laboratory animals (rats, mice, guinea-pigs).

B. suipestifer is a normal habitant of the alimentary canal of mice, guinea-pigs, and pigs ; it is rarely found in other domestic animals. In meat-poisoning, but seldom apart from it, it has often been isolated from the meat and the patients. In most instances the meat has been derived from the pig. It may be infected during the life of the animal, or after it has been killed. The former gives rise to the most serious cases, because the bacilli have multiplied and invaded the tissues generally. Meat poisoning in man may be associated with swine-fever in pigs. In this disease *B. suipestifer* occurs as a secondary

invader. The infection of meat by human carriers of this organism is unknown.

B. enteritidis (*Gaertner*) is frequently present in the alimentary canal of grey rats ; it has seldom been obtained from that of healthy human beings or of domestic animals, or from food (apart from cases of meat poisoning). In most instances of poisoning by this organism the meat is from cattle infected during their life. Only one instance of a human carrier of *B. enteritidis* has so far been discovered : a case of suppurative cholecystitis due to gall-stones. The organism was obtained from the stones, the bile, and the stools. There was no evidence that the patient had ever been a source of infection to other persons. In one instance an outbreak of acute gastro-enteritis was shown to be due to milk infected with *B. enteritidis* (Gaertner), obtained from a diseased cow.

Reference.—[1]*Lancet*, 1912, i, 705, 771, and 849.

PELLAGRA. *Leonard Rogers, M.D., F.R.C.P.*

W. E. Deeks[1] reports twelve cases of pellagra from the Panama Canal zone, of whom ten were females. The main symptoms were : raw irritable tongue, with a dirty necrotic membrane at its edge later ; in women a vaginitis with irritating discharge and also proctitis ; vomiting, and later diarrhœa ; a chronic dermatitis especially affecting parts exposed to the sun ; more or less severe acute nephritis disappearing with convalescence ; and in late cases, mental symptoms. He thinks the disease is related to physiologically deficient diet, with too much of starches and sugars and too little of proteids and green stuffs. This is borne out by the results of **Dietetic** treatment. The first three cases were nearly moribund on admission, and died within two days, while the fourth died of mental disease. The remainder were fed on fresh fruit juice, preferably oranges, meat broths, and milk, all starches and sugars being avoided. Dilute nitric acid, 15 to 30 drops in half a pint of water, was given three times a day on an empty stomach. Eggs, meat, fish, and vegetables were soon added, together with various fruits. Several of the last eight cases were severe, but all of them recovered on this treatment.

C. C. Bass[2] records that he has obtained a number of bacilli from the stools of pellagrous patients, and from corn supposed to have produced the disease. Nine of the most promising ones have been grown on a preparation of sterilized corn, and young chickens fed on the cultures ; one of them developed diarrhœa and an affection of the legs somewhat resembling a pellagrous rash.

G. N. Niles[3] thinks that if cases are investigated thoroughly, some form of Indian corn will be found to have entered into the diet. He finds meat, eggs, sweet milk, and buttermilk most useful in dieting the patients.

Pierre Boveri[4] records the results of examinations of the *cerebro-spinal fluid* in pellagra. He found it to be always clear and transparent as water ; the tension and the specific gravity were increased, and the globulin present was augmented, but no leucocytes were found, while

the fluid was always sterile on culture. It was especially in the typhoid-like cases that the intra-arachnoid pressure was increased. The paraplegia was usually of the inferior type, the parts most worked being more likely to become attacked. He thinks that maize is in some way the cause of the disease.

D. H. Sparks[5] records cases of pellagra in which the symptoms developed in the winter before the usual time with the onset of warmer weather. S. J. Hunter[6] has been investigating sand-flies in relation to pellagra in Kansas, and frequently found these insects breeding in streams near cases of the disease. He has fed numerous flies on pellagra patients, and subsequently on guinea-pigs and monkeys, with negative results, but will continue his work during the next summer.

TREATMENT.—Jean Nicolaide[7] reported to the International Congress of Dermatology, at Rome, very favourable results with what he calls "**Organo-Polymineralized Serum,**" the composition of which is not definitely stated, but it is said to contain substances extracted *in vacuo* from horse serum, and organic and mineral substances from blood plasma, and also made radio-active. In both Roumania and Italy good results have been recorded even in advanced cases, including some with advanced mental symptoms.

W. J. Cranston[8] has treated pellagra with injections of **Salvarsan,** but the results were not encouraging, relapses being frequent in apparently cured cases. A. J. Crowell[9] has treated nineteen cases with salvarsan, and gave three doses of 0·6 gram intravenously at intervals of ten days. Without exception all apparently recovered, but require to be followed up for some time before the final result can be given.

H. P. Cole[10] has brought up for discussion in England, his work on direct **Transfusion of Blood** in the treatment of severe pellagra, his recoveries being 58 per cent against 10 to 20 per cent formerly in similar cases.

REFERENCES.—[1]*Med. Rec.* 1912, i, 566; [2]*Jour. Amer. Med. Assoc.* 1911, i, 1684; [3]*Ibid.* 1430; [4]*Presse Méd.* 1912, 291; [5]*Jour. Trop. Med. & Hyg.* 1912, 131; [6]*Jour. Amer. Med. Assoc.* 1912, i, 547; [7]*Lancet*, 1912, June, 1638; [8]*Jour. Amer. Med. Assoc.* 1912, i, 1809; [9]*Ibid.* 1911, ii, 1687; [10]*Brit. Med. Jour.* 1911, ii, 1276.

PEMPHIGUS FOLIACEUS. *E. Graham Little, M.D., F.R.C.P.*

Hazen[1] reports two cases of this disease, in which pure cultures of *B. pyocyaneus* were grown from the heart's blood, liver, spleen, and kidneys, and from catheterized urine during life. In the second case, typical vesicles were produced on the unaffected skin by inoculating this with a culture of *B. pyocyaneus*. He also reports a case of dermatitis exfoliativa neonatorum which strongly resembled pemphigus foliaceus clinically, but the cutaneous infection here was with *Staph. albus*. Treatment in the latter case, which was confined to keeping the child warm and well-fed, proved unexpectedly successful. [*See also* DERMATOSES OF INTERNAL ORIGIN.]

REFERENCE.—[1]*Jour. Cut. Dis.* 1912, 319.

PENIS, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Two cases of primary *tuberculosis of the penis* following non-ritual circumcision are recorded by Wilson.[1] The patients were brothers, one thirteen years of age and the other younger, circumcised by a surgeon immediately after he had performed an operation on a tuberculous patient. The wounds healed, but fifteen days later an abscess was opened in the line of the circumcision scar and the inguinal glands became swollen. The diseased tissues were removed by curettage and dissection, and the wounds healed. The diagnosis of tuberculosis was made from sections of the tissue removed. The author suggests that primary tuberculosis may be more common than is supposed, being mistaken for syphilis, chancroid, and cancer, and that tuberculosis following ritual circumcision is less common than formerly owing to changes in the ritual.

Zigler[2] describes a case of *fibroid sclerosis of the corpora cavernosa.* There was severe pain, with acute curvature of the penis toward the abdomen during erection. There were two thick " almost calcified " plates on the dorsum of the penis, which were hard and tender. He denied syphilis, but the Wassermann test was positive. Administration of **Iodides** caused considerable improvement in the curvature and the pain, but the plates did not soften or diminish in size.

Subluxation of the penis is a rare condition, and two cases described by Norman Rainier[3] form an important addition to the clinical records. The cases occurred in boys of fourteen and sixteen years, and were stated to be due to goring by a bullock. The penis was dislocated from its sheath, and lay in one case at the base of the scrotum and in the other above and behind the testicles. In five collected cases the injury was due to a cart-wheel, to machinery, and to a horse falling on his rider. In only one case was the force applied directly to the penis, the others being due to violence applied to the perineum, scrotum, or pubic skin lifting the sheath away from the penis. The organ may appear normal, but on palpation the sheath is empty, and the penis, which feels like a " thickened piece of small bowel," is found displaced.

REFERENCES.—[1]*Ann. Surg.* 1912, i, 305; [2]*Med. Rec.* 1912, i, 70; [3]*Ind. Med. Gaz.* 1911, 417.

PERICARDITIS. *Carey Coombs, M.D., M.R.C.P.*

ETIOLOGY.—McNaughton and Rhea[1] describe a case of fatal *enteric fever* complicated by plastic pericarditis. The patient gave a history of recent rheumatic infection, so that in spite of the discovery of *B. typhosus* in the pericardial exudate, the typhoid nature of the lesion remains open to doubt.

DIAGNOSIS.—Fulton,[2] after a comprehensive study of the normal and abnormal cardiac mobility, concludes that fixation of the heart should always arouse a suspicion of adhesion of the pericardium to neighbouring organs. This opinion is the outcome of his autopsy findings. The general view is, however, that there is no certain sign of pericardial adhesion.

Pauly[3] says that when pericardial friction is heard over a wide area it is usually because the heart is enlarged by hypertrophy. When it is most clearly audible through the back, he regards it as significant of bulky pericardial effusion so distending the sac as to bring it into contact with the posterior thoracic wall.

TREATMENT.—Marfan[1] advises that **Paracentesis** be carried out by means of puncture through the epigastrium. The small trocar of a Potain aspirator is introduced in the middle line immediately below the xiphoid cartilage ; it is directed obliquely upwards, and more and more so the further it is inserted. By this route the pericardium is reached through the belly wall, the extraperitoneal connective tissue, and the diaphragm. When the punctures have to be repeated, the point of introduction of the needle may vary a little to one side or the other of the middle line. According to Marfan this is the easiest and safest means of approach to the pericardium.

REFERENCES.—[1]*Canad. Med. Assoc. Jour.* 1912, Sept. (*Lancet*, 1912, ii, 963) ; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1361 ; [3]*Rev. de Méd.* 1911, 591 ; [4]*Presse Méd.* 1912, 48.

PERITONITIS. *Robert Hutchison, M.D., F.R.C.P.*

Pneumococcal.—An account of this condition, to which a good deal of attention has recently been directed, appeared in the last issue of the Annual, and papers on the subject have since been published by Barling[1] and Hector Cameron.[2]

The disease is much commoner in children than in adults, and girls are more often affected than boys. Thus, out of a series of 234 cases collected by Barling, 73 per cent were in the female sex. The peritoneum may become infected either by direct transmission from the intestine, through the Fallopian tubes, from the blood-vessels directly, or by transmission through the lymphatics of the peritoneum.

Barling recognizes three clinical types : (1) Acute cases, presenting marked abdominal features from the first, but with no other pneumococcal lesions elsewhere. Seven out of his twenty-eight cases belonged to this class ; of these four recovered and three died. (2) Cases in which simultaneously, or almost so, with the onset of the peritonitis, a pneumonia develops. Fourteen of the twenty-eight cases were of this type, and of these only one recovered. (3) Chronic septicæmic cases. This included seven cases, of which only one recovered.

The chief *symptoms* are abdominal pain, vomiting, and diarrhœa. With the onset of the pain the abdomen rapidly becomes generally tender, immobile, and rigid ; later on these signs tend to become most marked in the lower zone, and often in the right iliac fossa. A high temperature is present from the outset. Signs of pneumonia, or of pneumococcal inflammation elsewhere, often coexist. The diagnosis from appendicitis is specially important, and may be impossible, but early and diffuse rigidity of the abdomen, and the occurrence of an initial diarrhœa, are strongly suggestive of a pneumococcal infection, and if pneumonia be present at the same time there is no room for doubt.

TREATMENT.—The chief question is whether or not immediate **Laparotomy** should be performed. Barling is in favour of it on the ground that free drainage of all collections of pus will aid the body in its struggle against infection. He considers that the impossibility of distinguishing some of these cases from appendicitis emphasizes the necessity for early incision. Cameron, on the other hand, points out that the peritonitis in a great majority of cases is merely part of a general septicæmia, and that, therefore, no great benefit can be expected from operation, whereas in a critical case it may turn the scale against the patient. He is therefore opposed to laparotomy as a routine practice, although the drainage of a residual abscess usually becomes necessary sooner or later. He suggests that it is usually better to wait, to place the patient in a sitting posture, to apply **Ice** to the abdomen, to give **Morphia,** to combat toxæmia by **Saline Infusion,** and to defer operation until the septicæmic stage is over and residual collections of pus can be localized. He believes that the difficulty of diagnosis from appendicitis is not so great as has been supposed.

Tuberculous.—The relative merits of *medical and surgical treatment* in this disease are still much disputed. In a discussion which took place at the British Medical Association meeting in 1911, Rolleston[3] stated that there is general agreement (1) That **Operation** is contra-indicated in generalized or widespread tuberculosis, and therefore in infants under twelve months of age, and in patients with signs of pulmonary tuberculosis; (2) That it is unnecessary in the fibrous and adhesive forms in the absence of any urgent symptoms of intestinal obstruction; (3) That it is necessary in cases of abscess formation and in intestinal obstruction. It must be remembered that the last complication may be simulated by the onset of tuberculous meningitis. The question of operation therefore concerns cases of ascitic abdominal tuberculosis. It has been supposed that operation reduces the feeble vitality of the peritoneal tubercles so that they undergo involution and death. More recently the explanation has been put forward that peritoneal tuberculosis being a local infection, the opsonic index of the ascitic effusion is lower than that of the blood; hence, after the removal of the ascites there occurs a fresh effusion which is of a higher opsonic index, and therefore has a curative action on the local tuberculous process (White). If this is true, simple paracentesis should be as effective as laparotomy. The advantage of laparotomy, however, over simple tapping, is that a local focus of tuberculosis which may give rise to reinfection and relapse after partial or apparent cure may thus be detected and removed (W. Mayo). In this connection it is important to get some estimate of the frequency with which such a focus is present and can be removed. In Mayo's twenty-six cases in which the Fallopian tubes were removed, twenty-five recovered permanently, and in seven of these, simple laparotomy had previously been performed from one to four times for the cure of tuberculous peritonitis. On the other hand, Stone, who

holds a brief for the hygienic as opposed to the surgical treatment, in 122 cases of tuberculous peritonitis of all ages did not find a primary focus in the Fallopian tubes or appendix in any case. Undoubted primary tuberculosis of the Fallopian tubes, though common in women, is very rare in young girls; Murphy quotes Maas as having, after a careful search, been able to collect only eight cases. As was shown by Murphy's experiments on monkeys, the Fallopian tubes rapidly become infected secondarily in tuberculosis of the peritoneum. In twenty-three cases of generalized tuberculous peritonitis in female children, nine showed tuberculous salpingitis (Still). According to Goodall, 99 per cent of the cases of tuberculosis of the Fallopian tubes are secondary, though in from 30 to 50 per cent of these cases the primary focus is not obvious. But secondary infection of the Fallopian tubes may give rise to very considerable enlargement, and the tuberculous focus thus produced, though not primary, may set up reinfection of the peritoneum and so require removal. In a girl aged nine, the Fallopian tubes infected secondarily to tuberculous peritonitis were the size of the index fingers of an adult, and were removed; ten years later she was in good health (Murphy). Removal of tuberculous glands may be very difficult, and an attempt may leave the patient worse off than before. The argument in favour of laparotomy that a removable tuberculous focus may thus be found, is on the whole valid, but not very strong.

It is generally agreed that the ascitic cases do well, whether they are operated upon or left alone. The following questions therefore arise: (1) Are the results better in the operative cases than in those which are treated medically? (2) As some cases begin as ascites and go on to the ulcerative or plastic stages, is there any reason to believe that early laparotomy will prevent this sequel? If so, operation would be justified. On these points statistics would be of value.

Although, as already mentioned, statistics on tuberculous peritonitis usually deal with all forms of the disease, it is desirable to quote some dealing solely with the disease in children. Faludi has drawn up tables showing the percentages of cures in parallel series of cases of tuberculous peritonitis in children, operated upon and not operated upon. The authors he quotes are Cassel, Monti, Pic, Schmitz, Schramm, and Sutherland, who all give parallel series of cases, operated upon and not operated upon. The divergence in these statistics is considerable. Schramm found 80 per cent of cures among the operated cases and 64 per cent among the non-operated; Pic observed recovery in 74 per cent of the operated cases and in 5 per cent only of the non-operated; Sutherland observed recovery in 50 per cent of the operated cases and in 81 per cent of the non-operated. By adding together all the operated cases we get eighty-eight cures, or 70·4 per cent, in 125 cases, as contrasted with fifty-one cures, or 33 per cent, in 156 cases not operated upon. The question of operation on ascitic cases may be fairly summed up in the statement that it should be tried after

hygienic and medical treatment has been given a trial for a month or so without any definite benefit.

G. A. Wright, speaking of the ultimate results of laparotomy and its value as a means of treatment, was of opinion : (1) That probably not much more than half the cases would live to grow up, for of those who recover for a time a large proportion die of tuberculosis in some form within a few years, though the immediate operative mortality is of course very small. (2) There is no hard and fast line between ascitic and plastic cases, either as a matter of morbid anatomy, of operative treatment, or of mortality. But operation is simple where there is much fluid, and may be impossible in obliterative cases. (3) Tuberculous mesenteric glands may be safely removed, and in some cases certainly should be removed. (4) The rôle of surgery in tuberculous peritonitis is rather to remove secondary troubles, such as obstruction, and to get rid of noxious collections of fluid and local foci of tubercle, than to play any great part in the prevention or cure of the disease as a whole.

McAdam Eccles gave five reasons in favour of laparotomy in the ascitic form of the disease :—

(1) Incision was safe, far safer than mere paracentesis ; (2) Exposure of the peritoneum confirmed diagnosis ; (3) Laparotomy might, and frequently did, expose a removable tuberculous focus ; (4) Opening the abdomen would allow of the wider application of remedial substances ; (5) Operation necessitated subsequent rest with the abdomen firmly bandaged. He could remember at least two instances where paracentesis performed to relieve ascitic distention produced only temporary benefit, and subsequent laparotomy was followed not only by immediate improvement, but by permanent cure. Diagnosis was sometimes difficult, but exposure of the peritoneum allowed not only the visual demonstration of tubercles, but the microscopic examination of the same. The surgeon safely opened joints containing fluid caused by uncertain infection, for the purposes of diagnosis ; why should he not do so in cases of ascitic fluid of equally uncertain origin ? The removal of a tuberculous focus, most commonly tuberculous glands or a tuberculous appendix in children, or a tuberculous Fallopian tube in older females, was one of supreme importance. This could only be carried out by operation, and he always made the incision in young children as for an appendicectomy. The wider application of remedial substances, such as 1–10,000 **Adrenalin** solution or a dilute **Iodoform Emulsion,** could only be carried out by operation. The rest subsequent to operation was very thorough, and could often be carried out more easily than without operation, for parents in private would appreciate its value.

Caird[4] has recorded the results of treatment by laparotomy in thirty-one cases of tuberculous peritonitis in adults. The cases belonged both to the ascitic and the adhesive types. Twenty-eight recovered. Ten of these could not be traced afterwards ; nine died at varying periods ; eight are known to be alive and well—one two years after

operation, one three years, one four years, four five years, and one nine years. He considers that these results, though not brilliant, more than warrant the procedure.

Hofmann[5] advocates extensive "pencilling" of the peritoneum, both visceral and parietal, with 10 per cent tincture of **Iodine** after a preliminary laparotomy, the wound being closed after the application. The effect of this treatment is to produce an immediate and profuse exudation into the peritoneal cavity, which, however, soon subsides. A cure results in about three or four weeks. He has carried out the method in four cases and has not seen any bad results. The effect was permanent up to a period of eighteen months.

REFERENCES.—[1]*Pract.* 1912, 557 · [2]Abst. in *Lancet*, 1912, i, 165 ; [3]*Brit. Med. Jour.* 1911, ii, 473 ; [4]*Edin. Med. Jour.* 1912, 295 ; [5]*Münch. med. Woch.* 1912, 531.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

TREATMENT.—It is being recognized that the treatment of *acute peritonitis* is essentially that of its cause. The improvement in the results is due more to greater accuracy of diagnosis and realization of the need for early surgical treatment, than to any great innovation in the surgeon's technique.

Fowler[1] gives an interesting statistical summary of 188 cases of diffuse septic peritonitis due to appendicitis, comparing different methods of treatment after removal of the appendix. In 122 cases the elevated head and trunk position was used, and fluids were given by mouth ; 90 cases recovered (73·7 per cent). Eighty-three of the cases had, in addition, saline enemata every three to four hours ; 60 of these recovered (72·3 per cent). Of the 39 patients who received nothing by the rectum, 30 recovered (76·9 per cent). In 58 cases the elevated head and trunk position and Murphy proctoclysis were used, while nothing was given by mouth ; 39 recovered (65·5 per cent). Of 72 cases in which the elevated head and trunk position was used and nothing was given by mouth (irrespective of the rectal treatment), 45 recovered (66·6 per cent) ; while of 112 cases treated by the elevated head and trunk position with fluids by mouth (irrespective of the rectal treatment), 90 recovered (73·5 per cent.)

In spite of the conclusions that might naturally be drawn from these figures, Fowler still believes that the ideal after-treatment is the elevated head and trunk position, the withholding of all nourishment by mouth, and the administration of saline by the Murphy method. He also suggests that an autogenous vaccine be prepared and given in each case.

Vignard and Arnaud[2] recommend the intraperitoneal injection of **Camphorated Oil** (1 per cent) in the treatment of acute diffuse peritonitis. They claim that it prevents the absorption of bacteria through the peritoneal lymphatics, and the formation of adhesions, thus making it possible to drain the peritoneal cavity and promote intestinal activity. The camphor acts as a cardiac stimulant, and

produces a rapid fall in temperature and rapidity of pulse. The oily solution of camphor is to be cleansed by shaking it with alcohol and then decanting. It is sterilized by heat in an air-tight vessel to prevent evaporation of the camphor. They advise the injection of 200 to 300 c.c.

Hoehne,[3] who has also had satisfactory results from the same device, recommends that the strength of camphor in the solution should not be greater than 0·5 per cent.

References.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1531; [2]*Rev. de Chir.* 1912, i, 772; [3]*Münch. med. Woch.* 1912, 871.

PHARYNX, DISEASES OF. *George L. Richards, M.D.*

Adhesion of Soft Palate to Posterior Wall of Pharynx.—Mackenty's[1] operation aims at lining the posterior surface of the palate with two flaps, one for each side, taken from the posterior wall of the pharynx below the original curve of the soft palate. These flaps are taken off as far down the pharyngeal wall as the atresia extends up the naso-pharyngeal wall, so as to cover the denuded area completely. A curved needle armed with fine silkworm gut is introduced into the mucous membrane of the posterior wall, just to the outer side and about 1 to 2 cm. below the central opening mentioned above, and

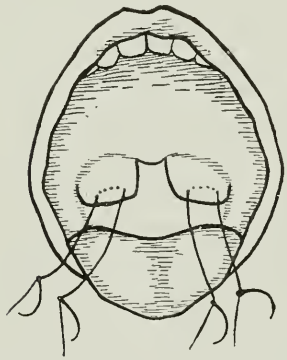


Fig. 90.

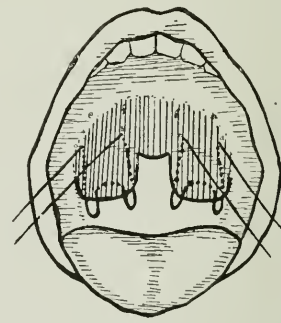


Fig. 91

is carried laterally to emerge at the edge of the posterior pillar. A similar stitch is taken on the other side. The points of entrance and emergence are about 1½ cm. apart (*Fig.* 90). With a sharp scalpel the flaps are now outlined, beginning at the outer side of the points of emergence of the stitches, curving downward and inward, then upward, to end at the entrance of the small probe opening into the nasopharynx. Then, with an angular knife or curved scissors introduced through the opening into the nasopharynx, the adhesion is separated out to the lateral pharyngeal walls and downward to the out-lined flap incisions. The stitches are held as traction sutures, keeping the tissues taut while the flaps are being separated from the pharyngeal

wall. The nasopharynx now lies wide open, and from the lower margin of the soft palate hang two flaps transfixed near their lower margins by two sutures. These flaps are turned backward and upward against the raw posterior surface of the palate, and are stitched into position. Four ends of sutures project from the mouth. Each end is threaded on a sharply-curved needle in a special holder, which grasps it parallel with the long axis of the handle. The needle is passed well up behind the palate, and the point is drawn forward through it above the raw area on the posterior surface. Similarly each of the four needles is brought into line with its relative place in the flap (*Fig.* 91), but the points of emergence should be a little higher than

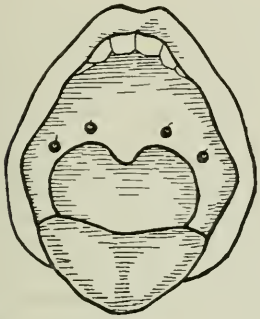


Fig. 92.

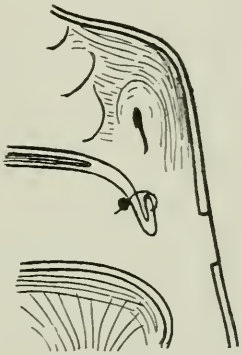


Fig. 93.

indicated in the diagram. By drawing them taut, the flaps ascend and take their position against the posterior surface. Fine perforated shot are threaded on each suture and clamped in position near the anterior surface of the palate, care being taken to allow for considerable post-operative œdema (*Figs.* 92, 93). The stitches are removed in four or five days, and then, if advisable, the patient is given a dilator to be used at home twice a week for two or three months. The accompanying diagrams are kindly lent by Dr. Mackenty.

Reference.—[1]*Med. Rec.* 1911, Nov.

PHLEGMON OF THE FINGER.

(*Vol.* 1912, *p.* 16)—This inflammatory lesion may be abated in its pre-suppurative stage by applying **Compresses of Glycerin.**

PIGMENTARY AFFECTIONS OF SKIN.

E. Graham Little, M.D., F.R.C.P.

Knowles[1] reports an example of multiple pigmentation and reviews the literature of similar cases. The pigmentation was of the covered parts of the body, probably due to actinic causes, unaccompanied by tumour formation, and had appeared four years after birth, the child being twelve years old when seen by the writer. Histological examination showed increased pigment in the basal layer and in the

corium, but no nævus cells. The condition was benefited markedly by **Carbon Dioxide Freezing** and **Trichloracetic Acid.**

Blue Atrophy of Skin from Cocaine Injection.—As a rare occurrence staining, accompanied or not by atrophy, is seen after habitual cocaine, morphine, and mercurial injections. Gottheil[2] reports such a case with cocaine, but was unable to identify the cause of the staining. It has been attributed to deposit of iron from the hypodermic needle, but this explanation does not cover the appearance of atrophy.

References.—[1]*Jour. Cut. Dis.* 1912, 83; [2]*Ibid.* 1.

PITUITARY BODY, DISEASES OF. (*See also* Brain, Surgery of.)
Herbert French, M.D., F.R.C.P.

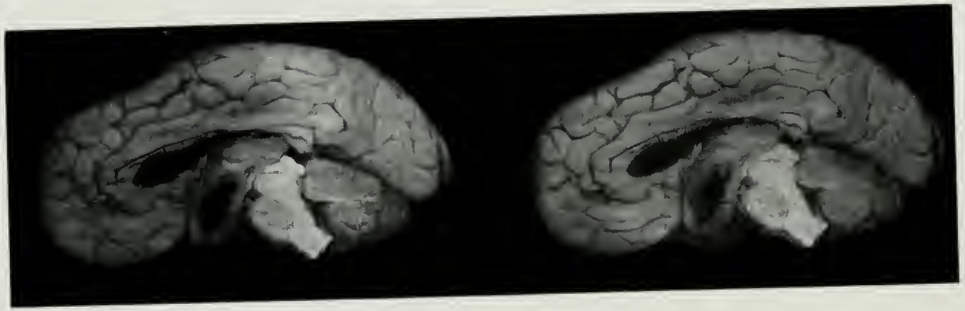
Whereas acromegaly is due to pathological changes in the anterior part of the pituitary body, there is increasing evidence to show that pathological affections of the posterior part of this body and of the brain substance in its immediate neighbourhood give rise to equally definite but entirely different symptoms which have been labelled "*dystrophia adiposo-genitalis.*" A series of articles upon the subject has recently been published by Prof. Ludwig Pick.[1] The clinical picture is fairly distinct. It consists in the rapid accumulation of subcutaneous fat, particularly in the buttocks, on the abdomen, and in the skin on and about the genital organs; together with atrophy of the sex organs, and pathological changes in the functions of the latter, such as irregularity in menstruation or amenorrhœa, absence of sexual desire, and of erections; diminution in the hairiness of the head, beard, arm-pits, and pubes; and when the malady begins before the age of puberty has been reached, there is a retardation in the growth of the bones, a persistence of the infantile state, and sometimes the production of actual dwarfism. In some cases there may be abnormal development of the breasts in males, or an assumption by the male pelvis of the female pelvic characters; and there may also be phenomena like those of myxœdema, the skin being cold and dry, the hair lustreless, and the nails brittle. The most striking objective features of a case are the local rapid accumulation of excess of fat and the alteration in the sexual characters: hence the name "dystrophia adiposo-genitalis."

Further investigation of the disease has shown that it does not depend so much upon the nature of the local change at the base of the brain as upon its site. Apparently any lesion which interferes with the floor of the third ventricle and the posterior part of the pituitary body may cause the symptoms, and a large variety of different primary and secondary tumours have already been recorded as doing so. This recalls the well-known fact that cases of cerebellar tumour are prone to be associated with increasing stoutness of the patient, even though the latter may be more or less comatose and persistently sick.

The importance of the fact that dystrophia adiposo-genitalis, though associated with tumours near or in the pituitary body, results rather

PLATE XXXI.

PITUITARY TUMOUR



Bristol General Hospital, No. 7306.

Photograph, Geo. Scott Williamson, Pathologist.

from the position of such tumour and not actually from the loss of function of the gland, makes the disease less amenable to surgical remedies than would be the case if the causal tumour were more localized. Although any operative measures having in view the removal of a pituitary tumour must always be accompanied by grave risks, surgical technique improves and advances so rapidly that there is already evidence, from work done by Handelsmann and Sir Victor Horsley,[2] to show that it is possible to remove the pituitary body in cats, monkeys, and other animals, without the result being inevitably fatal. Prof. Ludwig Pick discusses the question of the treatment of dystrophia adiposo-genitalis by surgical measures of a similar kind in man, and he does not think it impossible that certain cases may be cured some day in this way. He lays stress, however, upon the fact that the lesion causing dystrophia adiposo-genitalis nearly always proves to be much more diffusely infiltrating in the region of the floor of the third ventricle than is the affection of the pituitary body which produces acromegaly, and therefore the difficulties of operation for its relief must always be exceedingly great. (*See Plate XXXI.*)

REFERENCES.—[1]*Deut. med. Woch.* 1911, 1931, 1979, 2087; [2]*Brit. Med. Jour.* 1911, ii, 1150.

PLAGUE. *Leonard Rogers, M.D., F.R.C.P.*

At the British Medical Association meeting, C. J. Martin[1] gave a lucid account of recent investigations of the *epidemiology* of plague, most of which have been carried out by the Advisory Committee of Plague Investigations in India, under his direction. Pneumonic plague is directly infectious from one human being to another, but rarely produces extensive or prolonged epidemics. [The recent Manchurian outbreak is an exception to this rule, but there the circumstances were peculiar.—L. R.] The extension of the present epidemic round the world was not due to the pneumonic form, so the far more common bubonic variety is of much greater importance. This is not directly infectious from one man to another, while its relationship to rat plague has now been completely demonstrated. In all outbreaks carefully investigated, rat plague precedes human bubonic outbreaks by a few weeks, as shown by the curves of Bombay and other places minutely studied by the Plague Commission.

The infection may possibly be conveyed through soil and food contaminated by bacilli excreted by diseased rats or transferred from rat to man by a blood-sucking insect. Animals can be infected through the abraded skin with the fæces or urine of plague rats, but not so very easily or constantly as to render it a likely way in nature. The plague bacilli have little resisting power outside the body under ordinary conditions, and all the evidence is against natural infection through infected soil or food. Rats can, however, be fairly easily infected by feeding them with grain, etc., which has been grossly saturated with plague bacilli, but in that case the Commission found that the primary bubo was in the mesenteric glands in 72 per cent of

the infected animals, whereas in natural infection not a single mesenteric bubo was found in 6000 post mortems on plague rats. It is thus clear that rats are not ordinarily infected through feeding.

Experiments were therefore made in protected cages and godowns, which conclusively proved that infection does not spread from infected to healthy rats living together in the closest contact, provided all fleas are excluded. On the contrary, infection takes place between infected and healthy rats even when they are in separate cages so that there is no contact between them except through fleas, but only if the conditions allow of fleas passing from one animal to another. Moreover, it has been proved that plague bacilli multiply enormously in the intestines of fleas, and are passed in great number in their fæces, which are usually voided while they are sucking blood, and may thus be easily rubbed into the puncture wounds, which have been shown to permit infection. Regurgitation of plague bacilli through the mouth at the time of sucking has not been proved, but is not impossible.

Lastly, the rat flea theory is supported by the epidemiological facts established by the Commission, namely, that the epidemic plague season coincides with that of the greatest flea prevalence; successful flea transmission experiments are only one-fifth as frequent with the temperature between 82° F. and 85° F., a degree which causes a rapid diminution of plague. The rat flea hypothesis, therefore, furnishes satisfactory explanations of all the more important facts concerning the spread and prevalence of bubonic plague.

The same Committee have issued a further report.[2] Section XLI deals with recent observations on rat fleas, by Chick and Martin: *Pulex cheopis*, the common carrier of plague in India, is rarely met with in England, but was got near Guy's Hospital, and was not found in Suffolk, where a few cases of pneumonic plague occurred recently. The common rat fleas in England are *Ceratophylus fasciatus* and *Ctenopsylla musculi*, only the former of which bites man at all readily. In both Marseilles and Sydney the maximum prevalence of *P. cheopis* agreed very well with the occurrence of plague.

Sections XLII and XLIII record further important work by Sydney Rowland, on the protective and curative effect of the **Serum** of a horse immunized with a toxic nucleo-protein extracted from the plague bacillus, and on plague vaccines. He has now shown that by immunizing horses with solutions of the nucleo-protein he had previously extracted from plague bacilli, a serum can be produced which has both antitoxic and anti-infectious properties, and also exerts a markedly curative effect in rats when injected twenty-four hours after infection with virulent plague serum. He could obtain no evidence of any antitoxic action in Yersin serum previously prepared at the Lister Institute, so a very important advance appears to have been made. He hopes to obtain a still more powerful serum. He has also found that the toxic and immunizing properties of the plague bacillus are attached to the nucleo-protein. The bacilli also contain an enzyme

which, by means of hydrolysis, produces a fall in the toxic properties, accompanied by a rise in the immunizing power.

Section XLIV deals with a statistical study by M. Greenwood, of the connection between proximity to a railway and the frequency of plague outbreaks in Punjab villages, which lends some support to the view that there is a relationship between the two. In the following section the same worker deals with other factors, and concludes that large villages are earlier infected, but suffer less than small ones. The situation of a village is important, but exactly how is not known. Temperature and rainfall do not affect the rate of mortality in different years.

Section XLVI deals with an inquiry into the causes of the remarkable immunity of Eastern Bengal and Assam from plague. A few small outbreaks of pneumonic plague have occurred in the province, and also several small series of cases of bubonic disease, but it has never spread to any extent, although infection must frequently have been imported. This immunity is well known to be closely related to the flooded nature of the country and the wide separation of the hamlets which compose the villages. The Commission, in this report, show that the houses harbour a very much smaller number of rats than the thick mud-walled ones of plague-stricken areas. The number of rats caught per 100 traps set was only from two to ten in Eastern Bengal, against from twenty-two to fifty-four in towns where much plague had occurred.

G. W. McCoy[3] writes on bubonic plague in California associated with infection of ground squirrels. Of eleven cases in man, six gave a clear history of handling ground squirrels shortly before infection, the axillary glands being the usual primary site of the disease. The other five were in districts in which these animals were known to be infected. Anti-pest serum did not appear to affect the disease, some of the cases being seen too late.

V. B. Nesfield[4] advocates the treatment of bubonic plague by immediate **Incision** of the glands to allow of the escape of toxins. He did this in Lucknow, in 1907, and fifty-four out of sixty-two recovered, a mortality of only 12·9 per cent, some being hopeless cases. A crucial incision was used, and the wounds were dressed with iodine lotion, 1 dr. in 2 oz. of water, in absorbent wool. If seen within twenty-four hours, the chances of recovery are good, and a rapid fall of temperature and relief of headache ensue. None of his assistants became infected through operating on plague cases, although this has occurred elsewhere, and is a very grave danger.

References.—[1]*Brit. Med. Jour.* 1911, ii, 1249; [2]*Jour. Hyg.* 1911, xi, 122; [3]*Jour. Amer. Med. Assoc.* 1911, ii, 1268; [4]*Lancet*, 1911, ii, 1262.

PLEURA, WOUNDS OF. (*See* Thorax, Wounds of.)

PLEURISY.

(*Vol.* 1912, *p.* 18)—The pain of dry pleurisy may, it is said, be relieved by rubbing **Hexamekol**, a guaiacol compound in powder form, into the affected side.

PLEURISY, SURGICAL TREATMENT OF. *H. Hartmann, M.D., Paris.*

The treatment of pleurisy by **Injection of Air,** advocated by Lambrior, Agapie, and Vaquez, has of late been taken up again by Achard.[1] The pleura is punctured in the ordinary way ; then, at the moment when the air should be injected, aspiration is stopped, but the taps are kept open, and the bottle is filled with air from without, either with a charge-pump or with the rubber bulb of the thermo-cautery. It is useless to filter this air through cotton wool : it is filtered in its passage through the rubber pipes if they are moistened with fluid, as Pasteur showed in his experiments. Achard has never had any accidents. He begins to inject air as soon as the patient begins to feel discomfort in breathing, a sense of retrosternal constriction, and goes on till this feeling has quite disappeared. The air maintains a constant pressure within the pleural cavity, obviating the risks of decompression, giving comfort to the patient, and preventing return of the effusion.

This method is obviously not suitable for purulent pleurisy, which must be treated by incision. **Thoracocentesis** is justifiable only in the purulent pneumococcal pleurisy of young subjects, and in tuberculous pleurisy developing like a cold abscess ; and it must be confessed that many surgeons, Vanverts,[2] Bérard,[2] Dollinger,[2] prefer pleurotomy even in the pneumococcal cases. Vignard,[2] Mayer,[2] and von Eberts,[3] are impressed with the advantage of cautious siphonage of the pleura, but F. D. Lund[4] regards it as a difficult method which rarely attains its end. An early and efficient operation nearly always prevents the formation of a chronic fistulous empyema.

When, however, this latter condition does develop, the various pneumatic methods (continued aspiration, compressed air, respiratory gymnastics) may be resorted to ; thus, according to Garré,[2] the worst fistulæ may be cured. Beck's **Bismuth Injection** method should be used only with the utmost caution. **Extensive Resections of the Chest Wall** for purposes of mobilization (e.g., Estlander's operation) are of value when the cavity is extensive but shallow. If it is deep, methods of the Schede type are best ; sometimes Delorme's decortication of the lung may be added to this. These were the conclusions arrived at by the Société Internationale de Chirurgie, and agree with those of J. Rutherford Keer,[5] and of Lambotte,[6] who achieved twelve complete cures in fourteen cases treated by the **Thoracectomy** of Schede. The latter advises, further, that the skin flap be turned into the cavity, behind the upper ribs, in such a way as to fill the pocket which is here formed in the narrow space where complete resection is difficult ; then he sutures the lower part of the flap on to the diaphragm as high as possible. The raw surface which remains may be treated with Thiersch grafts as soon as granulation is fairly started.

References.—[1]*Paris Méd.* 1912, Feb. 3 ; [2]*Soc. Internat. de Chir.* Brussels, 1911 ; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 264 ; [4]*Bost. Med. and Surg. Jour.* 1911, ii, 394 ; [5]*Pract.* 1912, i, 791 ; [6]*Jour. Méd. de Bruxelles,* 1912, 121.

PNEUMONIA. *J. J. Perkins, M.B., F.R.C.P.*

TREATMENT.—During the past year several authors have contributed their experiences on the use of a **Pneumococcus Vaccine.** An autogenous vaccine is of course the ideal, but time usually forbids its preparation, and recourse therefore must almost invariably be had to a stock vaccine. Such an overwhelming proportion, however, of the cases of lobar pneumonia are due to the pneumococcus, that practically no disadvantage accrues.

It is regrettable to add that none of the authors seem to be able to trace any very striking improvement from the use of a vaccine. Raw,[1] for example, who has had a larger experience of this mode of treatment than anyone else, having used a vaccine in 207 cases during the last two years, considers it a valuable aid but not a specific remedy, though he holds that it should always be used in cases of a virulent type which threaten the patient's life. He can say, from the result of his large experience, that the vaccine in itself is harmless, and he has never noticed anything but a good effect from its use. He cannot say, however, that it can do anything towards hastening the crisis. On the other hand, a feeling of comfort associated with a rapid fall of temperature, follows the injection of a large dose, the effect on the pulse is always good, and in his cases there was a notable absence of complications. He is an advocate of large doses, commencing with an initial one of 50 million, followed in twenty-four hours if necessary by 100 million, and in some cases he has even given 150 millions. The death-rate of Raw's series of cases is 16 per cent, and Douglas Powell[2] considers these figures do not show much in favour of the value of vaccine treatment, the average death-rate of pneumonia being about 17 per cent. Powell favours quite small doses, starting with 15 or 20 million, which, however, he is prepared liberally to increase if necessary, with close observation of pulse and temperature. He has seen a decided reaction with rigor and elevation of temperature to 105° F. from even so moderate a dose as 20 million.

Charteris,[3] reporting on nineteen cases, could see no marked effect from the use of a vaccine either on the mortality or the incidence of complications.

Possibly in the future the use of an anti-pneumococcic **Serum** may be more effectual, Roemer having recently reported twenty-one cases treated with a serum which he had prepared, with a mortality of only 4·7 per cent. Excellent results have been claimed by Géronne[4] for the Neufeld-Haendel serum, which he has tried on twelve consecutive cases of undoubted pneumonia. The dose for adults given at first was 20 c.c., repeated next day if necessary, and for children 10 c.c.; but soon he found reason to raise the dose for adults to 40 to 50 c.c. Except in children, where intramuscular injections were given, the serum was administered intravenously, and Géronne insists on the importance of this mode of application.

Results in the children were nil, but in adults excellent; a marked fall of fever was induced almost immediately, and the effects on the

general condition are described as strikingly good. It cannot be said that the lung condition was radically altered. Géronne concludes that the fever could really be cut short by this serum, and insists not only on its intravenous use, but on its early administration, i.e., in the first two or three days of the disease.

Solis Cohen[5] strongly advocates the use of **Quinine** in large doses in the treatment of pneumonia, preferring the double hydrochloride of quinine and urea as the most active salt, which he gives intramuscularly in such quantities as 15 to 25 gr. every three or four hours for the first forty-eight or sixty hours, and after that in smaller doses, from 5 to 10 gr., by the mouth. Cinchonism does not develop, temperature, and pulse and respiration-rate fall, and delirium is abated or may even cease. On the other hand, he has to allow that crisis does not occur, that the percussion and auscultation sounds are uninfluenced, and that empyema may still arise. In his own words, "The most striking results are functional, and the most significant features the relief of respiration and the maintenance of cardiac vigour and blood-pressure."

Injections of **Camphor** in large doses (*page* 7), and of **Mercuric Succinimide** (*page* 24) are also recommended.

Complications.—Fussell[6] calls attention to *acute dilatation of the stomach* as a complication of pneumonia fraught with great danger to the patient, easily relieved and generally unrecognized. Though he himself has met with four typical cases, three within a year, he cannot find any mention in the text-books of this condition as a complication of pneumonia. The one feature which attracts attention in all the cases is the huge size of the stomach, which often occupies the entire abdominal cavity. The cause post mortem has been found to be a constriction of the duodenum at the root of the mesentery in practically every case. There is no question here of a chronic dilatation, as after relief the stomach returns to its normal size, and the patients have shown no sign of the disease after their recovery. The dilatation is therefore acute, and the question as to which is primary, the duodenal constriction or the dilated stomach, is still undecided. Fussell believes that the dilatation is caused by some toxic condition affecting the innervation of the stomach; and that the dilatation then causes, by traction, a constriction of the duodenum, leading to filling of the stomach with a huge amount of material.

The onset is sudden; for example, in one case the patient suddenly, without warning, vomited a large amount of sour material, and when seen was found to show great distention in the epigastric region, the left hypochondrium and the umbilical region protruding, while the right hypochondrium was flat. On percussion, a tympanitic note reached almost to the pelvis. The patient was collapsed, and his pulse running; but notwithstanding his moribund condition, a stomach tube was passed and a great amount of liquid removed; there was immediate disappearance of the swelling, and the patient was much relieved.

Six hours later a second washing was performed, and all stomach symptoms disappeared. Ultimately he made a complete recovery.

The whole of the literature contains the record of but eleven cases, six of whom died; the dilatation occurred before the crisis in eight, and in three after; vomiting occurred eight times, collapse in five cases, while distention of the abdomen was present in all. This usually occurs quickly, and though occupying the epigastrium, may extend to the whole abdomen. Constipation occurs in most of the cases, and creates for the whole picture a strong resemblance to intestinal obstruction. In obstruction, however, the distention is originally general over the entire abdomen, whereas in acute dilatation of the stomach it is likely to be in the epigastrium at first. The passage of the stomach tube, causing the immediate disappearance of gastric distention, will settle the diagnosis.

The first requisite for the relief of this condition, according to Fussell, is early diagnosis, so that the possibility of acute gastric dilatation occurring in the course of pneumonia must be borne in mind. Relief can be given and life saved in even the most desperate cases by **Washing out the Stomach.** All food and drink by the mouth must be interdicted, while in two of Fussell's cases **Strychnine** and **Eserine** seemed of value.

References.—[1]*Lancet*, 1912, i, 646; [2]*Ibid.* 755; [3]*Glasg. Med. Jour.*, 1912. i, 19; [4]*Berl. klin. Woch.* 1912, 1699; [5]*Amer. Jour. Med. Sci.* 1912, i, 40; [6]*Ibid.* 1911, ii, 794.

PREGNANCY. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Diagnosis.—Abderhalden[1] describes a method by means of dialysation which he says has never failed. He takes fresh placenta, washed perfectly free of blood, and by boiling with very dilute acetic acid by a special process, extracts fresh placental peptones.

The test consists in dialysing 1 gram of the placenta peptone with 2 to 3 c.c. of serum from the patient, separated by centrifugalization of the blood (if hæmolysis occurs, the serum is useless). This mixture is put to dialyse against water in the incubator at 37° C. for twelve to sixteen hours. The dialysate is then tested with "*Triketo-hydrindenhydrate*," and the colour-reaction depending upon the presence of substances produced by the peptolytic action of blood enzymes, is unmistakable if positive. In this way he has obtained positive results in man, animals, in extra-uterine gestation, and in disorders of pregnancy, such as hyperemesis, hydatid mole, and retained products.

He has also used a polarimetric method, depending upon the disintegration of placenta peptones with serum. The method, however, requires a special polarimeter, and the reading of the rotation, which is very small, is attended with difficulty.

The use of *X-rays* in the diagnosis of pregnancy is alluded to on *page* 56.

Disorders.—*Acidosis.*—Swayne[2] briefly reviews the significance of acidosis in pregnancy, and insists upon the necessity of applying tests for diacetic acid and acetone, and estimating the urea and ammonia

nitrogen ratio in cases of albuminuria, eclampsia, vomiting, and ptyalism. Acidosis is evidence of pregnancy toxæmia, and the prognosis in the various conditions varies with the intensity. The administration of chloroform should be avoided in such cases.

He finds that the administration of **Glucose** in pregnancy toxæmias, although it does not stop the acidosis, seems to do good, and the administration of carbonate of soda is rational.

Hyperemesis Gravidarum.—Fieux and Dantin[3] treated a very severe case of pernicious vomiting with an injection of **Serum,** 12 c.c., prepared from a healthy woman eight and a half months pregnant. No change whatever was noted, and the uterus was emptied in order to save the patient's life. A second patient, much enfeebled by the vomiting and showing acidosis, was treated with 4 c.c. of serum from a healthy woman about two and a half months pregnant, when it was assumed that it would be more active. The following day there was marked improvement. Later, a second injection of serum, 10 c.c., from a patient who had recently aborted, was given, and from this time a rapid recovery was made. No other treatment beyond the injection of serum was employed, and from the time of injection the patient was given any food she desired.

Toxæmias.—Mayer[4] treated three cases of pregnancy toxæmias with **Serum** obtained from normal pregnant women. One case of paræsthesia of fingers, with numbness and itching, received 10 c.c. of serum intravenously, and the condition cleared up in two days ; another of herpes gestationis received three injections, and recovered in ten days (treatment was commenced after labour) ; whilst the third, a bad case of eclampsia with fits and coma, received three injections of 20 c.c. at intervals of five and eight hours. She went through labour, and recovered consciousness in forty-eight hours.

Pregnancy and Tuberculosis.—Pinard[5] discusses the untoward influence of pregnancy on phthisis, while he has never seen a case of osseous tuberculosis made worse by pregnancy. The future of the child is discussed, and he does not think that transplacental infection is sufficiently frequent to be of practical importance. He strongly condemns the practice of inducing abortion in tuberculous subjects as a therapeutic measure.

Eclampsia.—Hastings Tweedy[6] gives the results of his treatment in seventy-four cases (mortality 8 per cent). He states that food is the actual exciting cause of eclampsia, and the primary cause of the toxæmia giving rise to heart-failure. Consequently he forbids all food, even milk and whey. The action of the food is not due to its liability to undergo decomposition, but to an excitant action. The predisposing causes are pregnancy and the failure to drink sufficient fluid to counteract the concentration of fœtal and placental toxins in the blood.

He modifies the ordinary treatment in the following manner. The patient is kept on her side to prevent asphyxia, which, if occurring, is treated by artificial respiration and oxygen. **Morphia,** gr. $\frac{1}{2}$, is given

hypodermically, and repeated in $\frac{1}{4}$-gr. doses up to 2 gr. in twenty-four hours; (or **Atropine** and **Scopolamine** may be given if not carried beyond a dose which reduces respiration to six per minute); the stomach is washed out, and an efficient purgative left in when finally emptied. The bladder is catheterized, and the urine measured and examined. The lower bowel is washed out with a solution of **Sodium Bicarbonate** (30 gr. to the pint) through a long rubber tube passed high, using many pints in order to soften and clear out the fæces; and $1\frac{1}{2}$ pints of the solution are left in the bowel. If after this the urine remains scanty, a similar quantity is given under the breast. Poultices are applied to the loins every three hours.

Interference with labour or the course of pregnancy he considers unnecessary, although he would perform vaginal Cæsarean section rather than let a patient die in labour. Forceps to hasten delivery are harmless but seldom necessary. Vapour baths and diaphoretics are condemned as increasing concentration of toxic content in body fluids; chloroform also is to be condemned, or at the most 15 to 20 drops given as practised by Stroganoff; in larger doses it is poisonous. Finally, he does not claim that deaths will not occur in the future, as fits have always an element of danger, apart from the actual cause.

Marsh[7] has performed **Cæsarean Section** under spinal anæsthesia in three cases, followed by hysterectomy for fibroids in two. All three mothers and one child lived.

References.—[1]*Münch. med. Woch.* 1912, 1939; [2]*Med. Press. & Circ.* 1912, ii, 58; [3]*Bull. de la Soc. d'Obst. et de Gyn. de Paris*, 1912, Jan.; [4]*Zentralb. f. Gyn.* 1911, 37; [5]*Ann. de Gyn. et d'Obst.* 1911, June; [6]*Brit. Med. Jour.* 1911, ii, 990; [7]*Jour. Amer. Med. Assoc.* 1912, ii, 940.

PROSTATE, CARCINOMA OF. *Oskar C. Gruner, M.D.*

A collection of specimens of malignant disease of the prostate made by Hutchinson,[1] under reviewer's direction, revealed the presence of four distinct types of malignant epithelial growth. Clinically, these differ from one another only in the length of time during which prostatic symptoms have been present. Two of the types are well known and require no special description, namely, the scirrhous and the medullary forms. Adenocarcinoma is rare, and is of a pronounced tubular type, but another form was discovered which may be designated tubular adenoma or tubular carcinoma of type A, in which the cell columns are perfectly innocent in appearance, but are malignant in functional properties. In the case recorded in the above contribution, these simple tubules showed extensive infiltration of the surrounding prostatic tissue. The acini are uniform in size, are not dilated in any part, and are devoid of corpora amylacea; the lining cells are usually in single file and their cell bodies are frequently vacuolated. The nuclei are relatively large but always basal in situation. (See *Plate XXXII, Fig. A.*) The stroma shows no hyaline degeneration. There was considerable evidence for regarding this as having arisen in the vesiculæ seminales.

The adenocarcinomatous form, or tubular type B, differs from the ordinary carcinoma even when seen with the naked eye. The tissue is very solid, and no minute cysts can be seen in it. The microscopic characters are shown in *Plate XXXIII, Figs. B, C.* The marked preponderance of glandular tissue over stroma is well seen, *Fig. C* showing the characters of the individual cells more plainly. The extremely dusky character of the cell-body of these cells is well shown in *Fig. B* by the apparent lack of definition in the acini. The channels of the ducts are seen to be irregularly branched, some of them are filled with masses of desquamated epithelial cells, others with homogeneous material. Here and there epithelial protuberances into the lumen can be seen ; they are made up of solid collections of columnar cells without a connective-tissue core. As a rule the gland spaces are lined by many layers of cells, whose shape varies from columnar to round, owing to irregularity of their arrangement, whereby it is not possible for every cell to be cut through in the same plane. The nuclear membrane is always very distinct. Mitoses are not infrequent. The connective tissue stroma is hyaline in many places, and colloidal degeneration was extensive in some parts of the glandular tissue. The fact that some portions of this type of tumour may present appearances closely resembling those seen in scirrhous carcinoma indicates that the type B is a transition form between type A and scirrhus.

The practical bearing of these observations lies in the suggestion that when operation material is received, the structure of which is referable to type A, the seminal vesicles should be removed as well.

The table page 403 may be found helpful for laboratory diagnosis.

REFERENCE.—[1]*Bull. Royal Victoria Hospital, Montreal*, 1912, No. 2, 141.

PROSTATE, DISEASES OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Wilson and McGrath[1] review the *surgical pathology* of the prostate, and add some observations based on the examination of 468 cases. In 387 cases of enlarged prostate, there was increase of parenchyma without apparent increase of the stroma in 70, of the stroma without apparent increase of the parenchyma in 17, and of both stroma and parenchyma in 300 cases. Diffuse or circumscribed round-cell infiltration was present in 266 cases.

The authors know of no hypothesis which sufficiently explains the causation of prostatic enlargement. The following stages are observed in the development of this condition : initial hyperplasia of the parenchyma, followed by retention of the secretions in the tubules and alveoli, parenchymatous degeneration, marked by atrophy and exfoliation of the epithelium. Muscular overgrowth occurs early in the development of the parenchymatous hyperplasia. Overgrowth of fibrous tissue is a constant factor. In 468 cases, 15·5 per cent were malignant.

A case of *sarcoma* of the prostate occurring in a man aged fifty-four years, is described by Pleschner.[2] Only thirty-six cases of this disease have been described. The principal symptoms were sudden and

PLATE XXXII.

ADENOMA OF THE PROSTATE

Fig. A.—From a tubular adenoma of the prostate of type A, showing simple acini of regular size, separated by a moderate amount of stroma, amongst which are fragments of muscular fibres.

PLATE XXXIII.

ADENOCARCINOMA OF THE PROSTATE

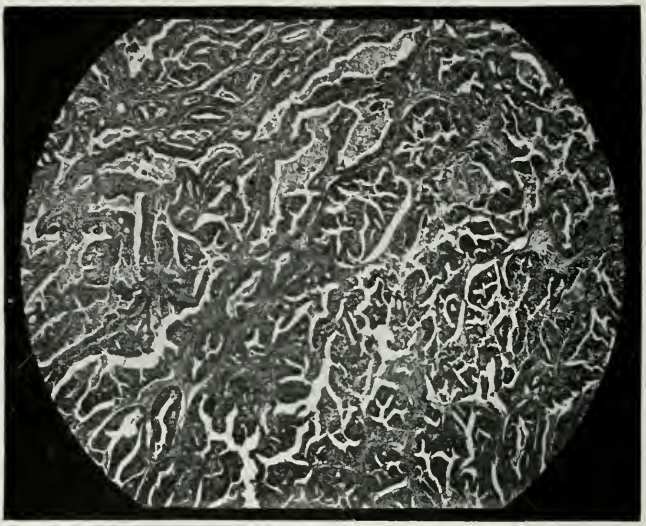


Fig. B.—From a low-power view of an adenocarcinoma of the prostate (tubular-type B), to show the contrast between this and type A. There is a large amount of glandular tissue and a very small amount of stroma. The former consists of masses of ducts varying in size and shape, recalling the structure of uterine adenocarcinoma. The epithelium is frequently stratified.

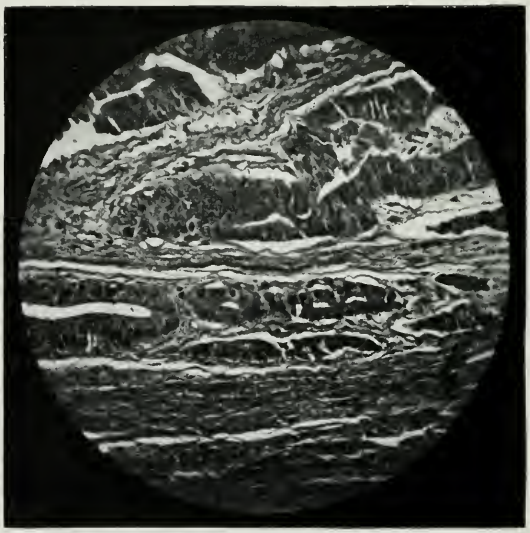


Fig. C.—High-power view of the same tissue, showing one or two of the individual flattened tubular passages. Some are seen to be lined by only one layer, others by several layers of rather broad columnar cells.

DIAGNOSIS SCHEME FOR SECTIONS OF PROSTATIC CARCINOMA

	Scirrhus	Tubular Type A	Tubular Type B	Medullary
Acini	Usually solid and short	Simple short tubes ..	Actively branching tubes	Solid strands, of variable length and thickness
Contents of acini	.. ..	Occasionally a few desquamated cells ..	Solid cell masses or homogeneous material—colloid substance at times	
Lining cells ..	Usually not more than two rows	In single file.. ..	Stratified	Fifteen to twenty rows
Shape of cells ..	Polygonal ..	Cuboidal or low columnar	Slender columnar	Polygonal or spheroidal
Chromatin ..	Leptochromatic ..	Trachychromatic—rather coarse	Amblychromatic — finely granular	Variable .. ..
Mitoses ..	Variable ..	Not visible	Occasional	Abundant
Stroma ..	Abundant—degenerative change occasional	Rather scanty—not degenerating	Scanty—hyaline change frequent	Variable in amount—degenerative change frequent
Cancer "parasites"	Occasional	Absent	Absent	Frequent .. ..

complete retention of urine necessitating catheter life, rectal obstruction, and eventually emaciation. A large pelvic tumour ascended half-way to the umbilicus and filled the rectum. Microscopically, the growth was a small spindle-celled sarcoma, with some perivascular arrangement of the cells.

A case of pyelonephritis and prostatitis due to *actinomycosis* is recorded by Theodor Cohn,[3] in a man of forty-six years. The diagnosis was made by examination of the urine, and of pus from the prostate. As no primary lesion could be found elsewhere, a hæmatogenous infection was most probable, and a so-called primary infection of the kidney, the first one on record, had resulted. No previous case of prostatic actinomycosis has been reported.

Scherck[4] has devised an instrument for *estimating the size of an enlarged prostate*. Its application is somewhat limited.

Prostatectomy.—Young[5] places on record the results of his operations for simple and malignant enlargement of the prostate. In cases of simple enlargement he " operated all told upon about forty-five cases, with a mortality of about 10 per cent," by the suprapubic method. The Bottini operation was used in eighty-five cases with a mortality of about 7 per cent, and unsatisfactory results in a large number. In 450 cases of perineal prostatectomy for benign enlargement, the mortality was 3·77 per cent. The method of exposure is that usually adopted in the perineal route, avoiding as far as possible the compressor urethræ. The membranous urethra is opened, and the prostatic retractor introduced. Young makes use of parallel incisions through the prostatic capsule on each side of the median sulcus, so as to preserve the floor of the urethra and ejaculatory ducts. One of the greatest advantages is that after enucleation of the prostate there exist two lateral extravesical cavities which can easily be packed with gauze and rapidly collapse after its removal. Another great advantage is that the patient can be up in a wheel-chair within two or three days, with " splendid dependent drainage."

In regard to after-results the following statistics may be quoted : The fistula closed in 18 cases during the first week after the operation, and in 56 per cent under twenty-one days. In 14 per cent there was a fistula after six weeks, and in 27 cases the fistula persisted after three months. In 4 out of 331 cases complete retention of urine has been present since the operation, in 8 cases there has been a partial return of obstruction due to incomplete removal or to " recontraction of a small sclerotic prostate," and in 8 cases the outflow of urine was not quite normal, the stream being rather small and the catheter showing a small amount of residual urine. There were three cases of " partial incontinence during the day-time," and two of persistent recto-urethral fistula.

The following information is given in regard to the effect on the sexual powers. In 133 cases the sexual power was stated to be normal before operation, and " of these 78, or 59 per cent, say that there has been a complete return of sexual powers since operation,

while in 100 cases (75 per cent) erections have returned. In cancer of the prostate, 42 cases were operated on, seven by the radical method of excision of the prostate, seminal vesicles, and neck of the bladder ; two of these were alive, one six and another two years after the operation.

Parker Syms[6] is an advocate of perineal prostatectomy in preference to the suprapubic operation. In order to avoid incontinence of urine after the operation, care should be taken to make a clean cut through the membranous urethra, so as to divide and not destroy the fibres of the compressor urethræ, and the bladder sphincter should be preserved. This observer recommends the use of bladder gymnastics as advised by Alexander, so as to promote voluntary micturition and control. "Many patients have practical control ultimately, yet they may have a slight leakage in certain circumstances." Urine may collect in a pouch formed by dilatation of the prostatic urethra, and dribble after micturition has apparently been completed.

Freyer[7] relates his experience in 1000 cases of total enucleation of the prostate for radical cure of enlargement of that organ. The patients varied in age from forty-nine to ninety years, the average being sixty-nine. There were amongst them 62 between eighty and ninety years, and 11 of seventy-nine years. The prostates weighed from $\frac{1}{2}$ oz. to 7 oz., the average weight being $2\frac{3}{4}$ oz. The mortality was $5\frac{1}{2}$ per cent, only 3 deaths occurring in the last 100 cases. The chief causes of death were uræmia due to chronic kidney disease, heart disease, and shock. In 181 cases the prostatic disease was complicated by the presence of stone in the bladder, and the mortality in these was 8·84 per cent, or nearly double that of cases uncomplicated by stone (4·76 per cent). Rapidity of operation is of great importance in minimizing the loss of blood and obviating shock.

Favento[8] discusses the cases of enlargement of the prostate operated on by Nicolich, in Trieste. Seventy-one cases were submitted to suprapubic prostatectomy, of which 12 died within the first month, a mortality of 16·9 per cent. The cause of death was almost always pyelonephritis ; one patient died of embolism of the lung. Of the 59 cases that recovered there was recent information in regard to 43. Of these, 34 were completely well and suffered from no bladder symptoms, and 9 had died of intercurrent diseases.

Siter[9] and Kraemer[10] both advocate **Dilatation of the Prostatic Urethra** in cases of prostatic enlargement. Siter is impressed by the large percentage of failures after prostatectomy that come under his notice. He sees many cases of persistent vesical fistula and of incontinence of urine. Dilatation of the urethra is performed with sounds, or with Kollmann's dilators (Kraemer), or with the finger after opening the bladder suprapubically. Some cases of "cure" of enlarged prostate by this method are claimed, but in some of Siter's cases portions of the prostate were removed, in addition to the dilatation.

The *post-operative treatment of prostatectomy* is the subject of a useful article by Bremerman.[11] During the period immediately

following the operation, the most important elements to be guarded against are shock, hæmorrhage, anuria, and sepsis. The preparation of the patient previous to the operation is important in avoiding shock. Where cystitis is absent, the operation is performed at once; where the bladder is infected, this is treated before the operation. In order to reduce the time of anæsthesia, the bladder is irrigated and filled and the skin cleansed prior to the commencement of the anæsthetic. Bremerman uses nitrous-oxide gas and oxygen as an anæsthetic, and considers it rapid and safe, reducing to a minimum the chances of shock and anuria, and avoiding the danger of pneumonia. One of the exciting causes of shock, particularly in the aged, is the persistent nausea, vomiting, and straining which follow ether or chloroform anæsthesia. Gas and oxygen anæsthesia is contraindicated where the patient has myocarditis, and ether should be administered in these cases. Immediately following the operation and continuing for twenty-four hours, hot salines are employed per rectum, and strychnine is administered with the saline if it is indicated.

At the operation, the region around the internal urinary meatus is carefully examined, and any fragments of tissue are removed. Irrigation with hot formalin solution (1–4000) is used to control hæmorrhage, and a thick-walled drainage tube (28 F.) is inserted, but does not touch the base of the bladder. The bladder and abdominal wall are closed around the tube.

The author has devised an automatic apparatus. This is a Sprengel's pump with an automatic flush at the reservoir. The water from the reservoir flows into a cup which tilts, when full, into a receiver at the upper end of one arm of the Y tubing. This apparatus is used until the fifth day, when it is removed together with the vesical drainage tube. The bladder is irrigated daily for three weeks with **Formalin** solution (1–4000), followed by an injection of **Nargol** (2 per cent). During the third twenty-four hours the patient is allowed to sit up, and on the fourth day gets into a chair. If there is pus in the urine, the bladder is irrigated once a week for several months.

Thomson Walker[12] discusses the *late results of suprapubic prostatectomy* performed by him in 112 cases of simple enlargement of the prostate. The immediate mortality was 5 per cent. After removal of the prostate there remains a cavity which is roofed over by the base of the bladder (*Figs.* 94, 95), and the communication with the bladder lies at the anterior part of the roof. A vertical strip from the posterior wall of the prostatic urethra, from the verumontanum downwards, is found adhering to the posterior wall of the prostatic cavity. The remainder of the prostatic urethra is removed with the prostate, and the area from which arise the nerve impulses supposed to initiate micturition, is thus destroyed. There is, however, no delay in the initiation of the act. The enlarged prostate dilates the sphincter of the bladder, which in 48 per cent of cases does not contract down and become active after the operation. This function is taken on by the compressor urethræ, as can be proved by passing a catheter with terminal eye,

first through the compressor urethræ, and emptying the bladder. Wallace and Page[13] have corroborated this observation by injecting the bladder and prostatic cavity with bismuth, and obtaining a skiagram.

In investigating the genital function it is of the utmost importance

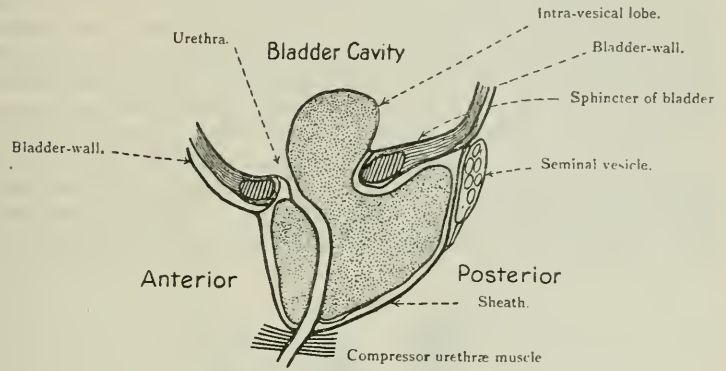


Fig. 94.—Diagram of Sagittal Section through Enlarged Prostate and surroundings.

to recognize the state previous to the operation. In many there has been a gradual decline, and in others it has been abolished for some years. In a few there is a state of extreme sexual irritation, which has led to unnatural sexual excesses by aged men. In 40 patients the following information in regard to the sexual function after operation was

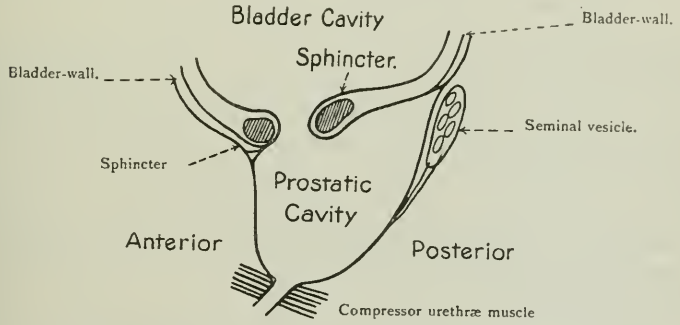


Fig. 95.—Diagram of Cavity left by Removal of Prostate.

obtained: no difference observed (desire, erection, and ejaculation normal), 35 per cent; slight gradual loss of desire, otherwise normal, 12·5 per cent; desire and erection normal, no discharge of semen, 32·5 per cent; diminished desire (otherwise as in previous class), 7·5 per cent; desire abolished, no erection, no emission, 12·5 per cent. The age of the patients in this last class ranged from sixty-six to eighty-six

years, and in four cases the sexual powers were failing or completely absent before operation. The absence of ejaculation in the third class is due to the presence of a cavity with fibrous walls in place of the prostatic urethra.

The restoration of the bladder muscle to its full vigour after long periods of complete atony and catheter life is one of the most striking features of complete prostatectomy. In 11·6 per cent some residual urine remained after the operation, but in only four out of sixty cases did it amount to 1 oz. or over. Complete atony of the bladder remaining after all obstruction has been removed belongs to a special class of cases, where the atony is independent of obstruction.

In regard to stone complicating enlarged prostate, there are two classes. When alkaline cystitis is present and persists after the operation, the calculi, which are phosphatic in composition, frequently recur. When the calculi are composed of oxalates and uric acid, and

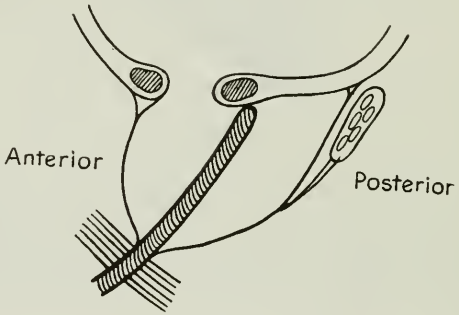


Fig. 96.—Diagram showing Arrest of Instrument by Roof of Prostatic Cavity.

alkaline cystitis is absent, they do not recur. In rare cases contraction may take place at the opening between the bladder and the prostatic cavity. There is frequently difficulty in passing instruments, due to the beak impinging on a ledge forming the roof of the prostatic cavity (*Fig.* 96). The average period for complete healing is three to four weeks; occasionally very old men take five to six weeks. There were two cases of persistent suprapubic fistula which were cured by operation.

For prostatic enlargement, **X-Rays** (*page* 62) have been applied with benefit; and the **Static Wave Current** (*page* 77) is recommended for cases of prostatitis.

References.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1601; [2]*Wien. klin. Woch.* 1912, 563; [3]*Berl. klin. Woch.* 1912, 1497; [4]*Jour. Amer. Med. Assoc.* 1912, ii, 339; [5]*Surg. Gyn. and Obst.* 1911, ii, 269; [6]*Ibid.*; [7]*Brit. Med. Jour.* 1912, ii, 868; [8]*Wien. klin. Woch.* 1912, 563; [9]*Therap. Gaz.* 1912, 386; [10]*Münch. med. Woch.* 1912, 143; [11]*Therap. Gaz.* 1912, 246; [12]*Clin. Jour.* 1912, ii, 261; [13]*Brit. Med. Jour.* 1911, ii, 1405.

PRURITUS.

(*Vol.* 1912, *p.* 78)—The very best treatment for this condition, it is alleged, is exposure to **Radium.**

PSORIASIS. *E. Graham Little, M.D., F.R.C.P.*

ETIOLOGY.—Carlentini[1] was able to isolate in pure culture from several cases of psoriasis a diplococcus which grew in agar, broth, and other media; these diplococci tended to group in pairs and resemble *M. tetragenus*. By means of a preliminary injection of 1 per cent peptone solution, in order to produce a "blood dyscrasia," he appears to have succeeded in making animals susceptible to the injection of an emulsion of these diplococci, the subjects treated showing lesions like psoriasis some two weeks later. He claims also to have succeeded in producing on himself a condition of the skin comparable with psoriasis by the same means.

TREATMENT.—Winfield,[2] regarding psoriasis as the result of auto-intoxication and metabolic disturbances, recommends **Colon Lavation** and the administration of **Lactic Acid,** in doses of from 20 drops to 1 dr., diluted with a full tumbler of water sweetened with sugar, and taken before meals. The irrigations are best given with the patient in the knee-chest position; and 2 to 3 quarts of normal saline solution at body heat are slowly injected, the reservoir being about 3 feet above the level of the patient's body. One injection a day, or even two if constipation is severe, may be given.

Sabouraud[3] reports twelve cases of psoriasis treated with daily intramuscular injections of 2 c.c. of **Enesol,** an organic compound of arsenic and mercury; in nine of the twelve cases the results were so satisfactory, after 15 to 20 injections, that Sabouraud recommends the method in preference to the usual local treatment, which is always disagreeable.

Heimann[4] reports a success with treatment by the "**U-viol Lamp**" (the ultra-violet rays) in an infiltrated psoriasis which had resisted many forms of treatment. Forty sittings, covering sixty days, were given, the exposure being ten to fifteen minutes at a distance of 18 cms. from the body.

Uranium Oxide may be applied in a lotion (*page* 70).

REFERENCES.—[1]*Gaz. deg. Osped.* 1912, 11; [2]*Jour. Amer. Med. Assoc.* 1912, ii, 416; [3]*La Clinique*, 1912, *June* 7; [4]*Jour. Cut. Dis.* 1911, 635.

PUERPERAL STATE, DISORDERS OF.

Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.

Puerperal Infections.—Western[1] analyses the results in 100 cases of puerperal infection, 56 of which were treated by **Vaccines** and 44 untreated. He concludes that the mortality amongst those cases of septicæmia in which there is definite bacteriological evidence of bacteria in the blood-stream, is from 85 to 95 per cent. By inoculation with autogenous vaccines this may be reduced to about 55 per cent. The mortality amongst notified cases of puerperal fever is about 60 per cent, which may, by inoculation with appropriate vaccines, be reduced to about 30 per cent. "Stock" vaccines give inferior results, and should be used only when an autogenous vaccine cannot be obtained.

The series of 44 cases not treated with vaccine could not be unreservedly used for comparison with the results of vaccine treatment, as the former included cases in which the infection was so mild that vaccines were unnecessary, and so severe that death supervened before one could be prepared.

The importance of the manner in which the culture from the uterus is taken, is emphasized. The technique, after pulling down the cervix in order to straighten the uterine canal, consists in passing up a sterilized glass tube covered with a cap and containing a sharp-pointed pipette, to the fundus, withdrawing an inch, perforating the cap with the pipette, and aspirating some pus into the latter, which is then withdrawn through the outer glass tube, and the contents used for inoculation of media and preparation of film. This is the most certain method (successful in 80 per cent of cases) of obtaining a growth of the infecting agent, and it is remarkable how frequently the growth is pure and uncontaminated by the cervical flora.

In blood cultures, the growth often takes days to develop, and may be positive on one occasion and negative on another. During or after a rigor, the blood is more likely to give a positive result.

Furneaux Jordan[2] details results in 45 cases. The infection in 17 of the 21 cases bacteriologically examined, was streptococcal. Mackay, who performed the examinations, claims that the streptococcus isolated was the same in all cases, and differed from *S. fæcalis* in its action on mannite, and from *S. pyogenes* in that it clots milk. The procedure recommended in a case of puerperal pyrexia is that a culture be obtained from the uterus while exploring it; next, a 5-million dose of stock streptococcal puerperal vaccine be administered while waiting the result of bacteriological investigation, and thereafter an autogenous vaccine. The importance of the treatment consists in its application early in the condition. (*See also pages* 46, 48.)

Surgical Treatment.—Miller's[3] introductory address before the section of Obstetrics and Gynæcology of the American Medical Association, deals with the present status of surgical treatment in *puerperal thrombophlebitis*. In this condition the mortality under expectant treatment has been variously estimated at from 50 to nearly 100 per cent. Operation in 37 cases collected by Steitz has given only 38 per cent of recoveries, but it is to be remembered that these represent the gravest type, and an observer of the experience of Lenhartz did not hesitate to say, after studying the cases, that perhaps all would have succumbed. If, however, cases of vena cava thrombosis, acute pyæmia, peritonitis, and faulty ligation of vessels are deducted, figures are obtained which serve to establish an estimate of operative results. The general mortality was 21 per cent; only 8·5 per cent when the ovarian veins alone were affected, rising to 31 per cent when one or both hypogastrics were also involved.

The *diagnosis* of thrombophlebitis is summed up in the occurrence of rigors, hectic pyrexia, and the palpation of worm-like thrombosed veins, together with the absence of pelvic exudates and peritonitis.

The frequency as given by various authors varies between 30 and 50 per cent of puerperal fever. These figures are not borne out by post-mortem findings, because the thrombophlebitis has been succeeded by metastatic abscesses, peritonitis, and peri-venous abscesses, showing that operation should have been performed before these lesions developed.

Huggins,[4] in recording at the same meeting four cases operated on, with one death, gives his experiences. He rests the diagnosis upon the exclusion of other states, and the association of rapid and high rises in temperature, with a corresponding elevation in the pulse, followed by a fall of both almost to normal within a few hours. Rigors are frequently present, but may be absent; occasionally it is possible to feel the thrombosed ovarian vein, with cellulitis around it, as a cord extending up in the course of the ureter, in association with which there is often albumin in the urine. Blood cultures are sterile.

The operation is usually performed through a median incision; the thrombosed vein is readily felt, ligated proximally, and removed. In the discussion which followed, extirpation of the uterus was also advised, as in many instances the veins in the walls are found thrombosed and to be the seat of small abscesses. Drainage is essential. Septic complications, such as abscesses and streptococcal pleurisy, following the operation, are recorded.

REFERENCES.—[1]*Lancet*, 1912, i, 351; [2]*Brit. Med. Jour.* 1912, ii, 1; [3]*Jour. Amer. Med. Assoc.* 1912, ii, 157; [4]*Ibid.* 160.

PULSE, IRREGULARITIES OF. (*See* AURICULAR FIBRILLATION.)

PURPURA. *Herbert French, M.D., F.R.C.P.*

The occurrence of visceral hæmorrhages in association with petechiæ under the skin is a familiar phenomenon in Henoch's purpura, and so extensive may the hæmorrhages in the submucous coat of the bowel be, that symptoms precisely similar to those of acute intussusception may result; indeed, the submucous hæmorrhages may actually lead to the production of an intussusception, so that in such a case the difficulty of deciding whether the abdomen should be opened or not may sometimes be very great. It would perhaps be surprising if similar hæmorrhages from the kidneys, stomach, rectum, and so forth, did not sometimes occur without any actual hæmorrhage in the skin. F. H. Edgeworth[1] quotes cases that have suffered over a period of years from recurrent visceral hæmorrhages, either from the stomach, the kidneys, or the rectum, or from more than one of these at a time; in some cases there have been petechiæ under the skin, in others none. He contends that there is a type of visceral hæmorrhage of a chronic or recurrent kind occurring without skin hæmorrhages, but due to precisely the same cause as those better recognized cases in which recurrent visceral hæmorrhages are associated with subcutaneous purpura. What the actual cause of all these hæmorrhages is has yet to be found out, for although the type which is seen in children has been given the name Henoch's purpura, the actual pathology of the

latter is unknown, and there is some evidence to show that whereas Henoch's cases were children, similar symptoms may occur in adults also.

That some such cases are due to the effect of microbial or other toxins yet to be identified seems probable, but Charles F. Withington[2] suggests that the hæmorrhages in these patients are allied to the non-hæmorrhagic lesions of angioneurotic œdema. He points out that there is a close relationship between four apparently different kinds of skin lesion, which in degree of their severity may be labelled (1) erythema, (2) urticaria, (3) angioneurotic œdema, and (4) purpura. Although a simple case of any one of these may seem at first sight to have no relationship to a case of any of the other three, nevertheless, when a large number are watched, transitional stages are found, and the conclusion is that erythema may merge directly into urticaria, that urticaria has points which connect it with angioneurotic œdema, whilst both may have relationships to purpura. There are also certain substances, as antitoxic serum, which will produce erythema in some individuals, urticaria in others, but in rarer cases may lead to either fleeting œdema of an angioneurotic type or subcutaneous purpura, thus further indicating the absence of any real line of demarcation between the four. Elaborating this idea, Withington points out how some cases of visceral bleeding—hæmatemesis, rectal hæmorrhage, hæmaturia—may be of a similar nature, so that the sufferings of some persons from periodic vomiting with or without hæmatemesis, and others who develop extraordinary abdominal attacks simulating gastric or intestinal crises with symptoms so severe as to suggest the need for laparotomy, may be due to changes analogous to erythema, urticaria, localized œdema, or purpura in the skin. He does not suggest what is the cause of the purpura itself, but none the less the view that it may be allied to urticarial or purpuric skin eruptions opens up a wide field for clinical thought, and brings some of these cases into line with what at first sight might seem to be an entirely different malady, namely, bronchial asthma, for although this may not have any apparent relationship to purpura, it is undoubtedly allied to spasmodic, functional, or angioneurotic œdema.

References.—[1]*Brit. Med. Jour.* 1912, i, 715; [2]*Bost. Med. and Surg. Jour.* 1912, i, 511.

PYLORUS, CONGENITAL STENOSIS OF.

Frederick Langmead, M.D., M.R.C.P.

Etiology.—Opinions are still divided as to the cause of so-called congenital hypertrophic stenosis of the pylorus in infants. Many believe the condition to be in truth a congenital malformation; others follow John Thomson in ascribing it to spasm. In support of the former view, P. L. Hipsley[1] asserts that microscopically the condition is not one of simple hypertrophy of the pylorus, but that there is increased fibrous tissue as well as thickening of the muscular layers. Moreover, interspersed between these circular muscle fibres, are bundles

of muscular fibres running in different directions; some come from the longitudinal layer and run for variable distances through the circular fibres, many of them extending as far as the submucosa. In favour of an antenatal origin, we have cases reported in which the pyloric tumours were found in the bodies of fœtuses. Cunningham finds that many of the individual fibres of the hypertrophied muscle are of the giant type, a form which is believed to be always congenital. On the other hand, there is little doubt that spasm is responsible, at any rate in part, for the obstruction. As W. B. Lewitt and Langley Porter[2] point out, the fact of spasm must be accepted, for it is testified to by so many clinical events. There is no proportion between the degree of hypertrophy and the amount of obstruction, the largest tumours being often accompanied by the fewest symptoms. The varying intensity of the peristaltic wave in the same case suggests a varying obstruction, as does also the occasional passage of a large milk stool. Batten has reported the case of a child who after apparent recovery died eleven months later; at the autopsy, characteristic hypertrophy was found, an indication that spasm played an important part in the symptoms.

Treatment.—The question of *operative* treatment is still a much disputed point. Hutchison believes operation to be altogether unnecessary, and records seventeen cases treated at home by medical means only, all of which were successful. In the Hospital for Sick Children, Great Ormond Street, of sixty-four cases treated medically, four out of every five have died. He suggests that they became "hospitalized." In both series **Lavage** and careful **Dieting** were the methods chiefly relied upon. Those who have recommended early operation have usually taken the standpoint that the disease is a congenital malformation, and therefore cannot be expected to improve under other forms of treatment. Even if this conception of its nature be accepted, it must be remembered that normal growth rapidly widens the pyloric canal, while it adds little to the thickness of the muscle. Thus Pfaundler has found that the lumen rapidly widens at the end of the fourth week, and is then $\frac{5}{10}$ in. wider than at birth. In time the normal increase of the lumen ought to neutralize the overgrown pyloric wall. Thus, if patients can be kept alive for a few months, obstruction no longer exists.

A. A. Lendon[3] has collected the cases published in Australia, nine in all. Eight were operated upon, and one recovered under medical treatment. Of those who were operated upon, in two cases Loreta's operation was performed, and both died; in the other six, posterior gastro-enterostomy was done, two lived and four died, one surviving for five weeks and one for ten days.

One of the essentials of *medical* treatment, as Cheinisse[4] points out, is to reduce the bulk of the meals, giving only small quantities at frequent intervals. Believing that the movements of sucking are liable to increase the pyloric spasm and the violence of the peristalsis, he suggests that this may be avoided by feeding entirely by a nasal

catheter. To combat the irritability of the stomach, Heubner, and also Marx, recommend that after meals a **Cold Compress** or other cold application be made to the epigastrium. The value of **Gastric Lavage** is not so generally recognized on the Continent as in England. Fredet and Guillemot, whilst acknowledging its advantages in mild cases or cases of moderate severity, consider that in severe cases it is not without certain disadvantages, as it tends to increase the asthenia and produce collapse.

(See also MEDICAL ANNUAL, 1912, p. 465.)

REFERENCES.—[1]*Austral. Med. Gaz.* 1912, 523; [2]*Jour. Amer. Med. Assoc.* 1912, i, 256; [3]*Austral. Med. Gaz.* 1912, 521; [4]*Sem. Méd.* 1911, 565.

RANGOON, UNCLASSIFIED FEVER IN.

Leonard Rogers, M.D., F.R.C.P.

A. Whitmore and C. S. Krishnaswami[1] describe what they believe to be a new infective disease occurring in Rangoon, a septicæmic or pyæmic affection caused by a bacillus distinct from other known pathogenic bacteria, which is easily isolated and identified. It is especially prevalent among chronic morphia injectors. The clinical signs are not yet known, but pathologically it is characterized by lesions somewhat similar to those of glanders, peculiar cheesy consolidation of the lungs, dissimilar in its distribution from either pneumonia or tubercle, These contain a large number of Gram-negative bacilli of the size and shape of *B. mallei*, which are at first taken for those of glanders, but grow very luxuriantly on agar. When inoculated intraperitoneally into a guinea-pig, they cause death in thirty-six hours, but without any enlargement of the testicles, the same organism being recovered from the effusion.

Altogether this organism has been found in no fewer than 38 cases during the last ten months, 30 of the subjects showing marks of morphia injections. Twenty-four were moribund or dead on reaching the hospital, and in twelve there were serious dysenteric lesions in addition to the bacillary infection. The typical lung lesions were the size of hazel nuts, with pale cheesy centres and an outer hæmorrhagic zone, distributed in any part of the organ, producing prominences on the surface, and occasionally forming abscesses. Similar lesions also occur less frequently in the liver, spleen, and kidneys. In the one case observed throughout in hospital, abscesses occurred in the subcutaneous tissues, and signs of consolidation in the lungs, the patient being a prisoner who had been admitted in good health.

REFERENCE.—[1]*Ind. Med. Gaz.* 1912, 262.

RAT-BITE FEVER. *Herbert French, M.D., F.R.C.P.*

Sokodu is the name used in Japan to designate that febrile illness which is now beginning to be known in Great Britain under the name of "rat-bite fever." Horder[1] has given a full summary of the clinical manifestations, and although he was unable to say definitely to what it was due, he concluded that it was the result of the transmission by the rat-bite of some protozoal infective agent to the bitten human

being. It is now being learned not only that the disease may be transmitted by such rats as happen to be infected with the offending protozoan in Japan and China, but that there are also sporadic cases in Europe, one such having been recorded by Cesare Frugoni[2] in a patient who had never been out of Italy, but who developed the characteristic symptoms as the result of being bitten by a rat. The wound in these cases may have been quite small, and it may have healed up in a short time quite normally. After the incubation period, which generally varies from one to three weeks, but may sometimes extend to several months, both general and local symptoms develop quite unexpectedly.

The general symptoms consist of shivering, a rise of temperature to 102 or 104° F., headache, nausea, and a sense of extreme illness. The local phenomena take the form of unexpected inflammatory changes at the site of the apparently well-healed rat-bite, accompanied by a reddish swelling, pain, the formation of vesicles, and later of shallow ulcers, associated with enlargement of the neighbouring lymphatic glands; the latter, however, never suppurate, and there is no enlargement of the spleen. This first period of the illness lasts a very variable time, with remittent pyrexia, alternations between feelings of chilliness and heat, and with fluctuations in the local inflammatory changes. In a few cases that end fatally, the constitutional symptoms become progressively worse until the patient dies. More often, however, a stage of apparent cure supervenes, after which, with the most obstinate certainty but with longer or shorter intervals varying from a few days to a few months, fresh periods of pyrexia recur, usually with more or less general enlargement of the lymphatic glands and with widespread skin changes of the nature of erythema exudativum. A long-drawn-out illness thus results, running a course that sometimes extends over several years before the periodic recurrence of the febrile attacks becomes slowly less and less obvious and the patient ultimately loses them.

Ogata is said to have discovered the causal protozoan and to have demonstrated the various stages of its life history; these findings require confirmation.

TREATMENT.—**Salvarsan** has been used with satisfactory results (*page* 38.)

REFERENCES.—[1]*Quart. Jour. Med.* 1910, iii, No. 10, p. 121; [2]*Berl. klin. Woch.* 1912, 253.

RAYNAUD'S DISEASE. *Herbert French, M.D., F.R.C.P.*

The term "Raynaud's disease" should be restricted to those cases in which the symptoms in the hands and feet and other parts cannot be shown to be due to actual disease of the vessels or of the circulatory apparatus, so that the underlying causal factor has to be assumed to be a functional error of the vasomotor system. One regrets therefore to find Brett and Chalier[1] apply this term to cases in which there were demonstrable gross lesions in the cardio-vascular

apparatus. It is more accurate to describe these as cardio-vascular cases accompanied by symptoms similar to those of Raynaud's disease, reserving the latter term for the purely functional type, as Raynaud himself tried to do. The first case published at great length by Brett and Chalier was that of a man, aged fifty-four, who had suffered from severe attacks of acute generalized articular rheumatism, and now had a large heart, mitral stenosis, and adherent pericardium. At the same time he presented the syndrome of Raynaud's disease, which had begun twelve years previously, particularly in the hands, and had progressed so that for seven years he had repeatedly suffered from syncope of his fingers, and more lately from trophic changes with local patches of gangrene. The radial arteries were much obstructed, and this was probably a principal factor in the Raynaud's phenomena. The patient died of heart failure. Their second case concerned a man, aged fifty-two, who had also suffered from acute articular rheumatism, and had a large heart, with mitral bruits, local syncope, and local asphyxia of his extremities. At the post-mortem examination, adherent pericardium was found, with mitral stenosis, no lesions of his nerves or large vessels, but a terminal acute endocarditis. A third and a fourth case were very similar, all the patients suffering from mitral stenosis.

Reference.—[1]*Rev. de Méd.* 1911, 603.

RECTUM, CANCER OF. *Sir Charles B. Ball, Bart., M.Ch., F.R.C.S.*

In the discussion on the surgical treatment of cancer of the rectum, at the annual meeting of the British Medical Association, Sampson Handley[1] made a useful suggestion. Instead of temporarily closing the upper lumen of the colon where it protrudes through the colotomy opening in the abdomen, he secures a catheter into it, ligaturing the bowel round the tube. Through the catheter large quantities of saline fluid, which cannot be rejected by the patient, can be introduced during the day or two following the operation. The catheter also serves occasionally as a flatus tube. The bowel is opened and the catheter removed on the fifth day.

In an admirable paper, W. T. Mayo[2] reviews the progress of the surgery of cancer of the rectum since his last report two years ago, in which he dealt with 120 cases in the practice of the brothers Mayo. He now contributes statistics of seventy-one additional cases, dealing generally with the subject as follows.

"Operation for cancer has two principal objects: (1) Complete removal of the local focus, with such adjacent tissue as might possibly be affected; and (2) The removal, to as great an extent as possible, of the tributary lymph-nodes. To accomplish these objects in operating for cancer upon the true rectum, means the removal of the entire organ with such a destruction of the muscles and nerves as will probably render efforts at securing a controllable anus impossible. While a brilliant result is occasionally obtained by drawing the sigmoid downward and passing it through the muscles of the anal canal from which

the mucous membrane has been removed, such fortunate instances are rare. In most cases there results a preternatural anus at the normal situation, and this latter condition cannot be considered a restoration, but merely a sentimental attempt to place what amounts to colostomy at an unfortunate situation—the anal site. This is especially true if the muscles and nerves have been seriously damaged ; in such cases an abdominal colostomy or a sacral anus will give as good or better results at a smaller risk.

" The necessity of a wide eradication of the disease, with at least 6 in. of apparently sound bowel above, and not less than 2 in. below, with all the surrounding fat and glands, usually means a permanent colostomy in some situation. The functional incapacity following the operation must be accepted by the patient as the price paid for the cure. Occasionally a case may be found early enough, so that the disease can be removed locally with success. In five instances in the clinic in St. Mary's Hospital, cancer of the rectum was discovered early enough to permit removal of the focus by a purely local operation, and no recurrence followed. In a few cases the strictly local nature of the disease seemed to justify a limited resection of the rectum, with direct suture in continuity ; but in the greater number of cases such operations cannot be considered, as they either subject the patient to an operation which is not radical and gives but a faint hope of cure, or greatly increase the danger of sepsis from leakage.

" Failure to remove the disease in an orderly manner, and not the natural tendencies of rectal cancer, is responsible for the pessimism of the profession toward the radical operation for removal of malignant growths in the rectum and rectosigmoid.

" High-lying carcinomata of the rectum, in the so-called first portion of the rectum, in the large majority of cases, can be considered to have their origin in the terminal sigmoid. Since, in most of these cases, the rectum is involved in its upper portion, and must in all be removed to a great extent, it is wise to consider all high rectal and terminal sigmoid growths in one group as rectosigmoid. They form a very considerable percentage of carcinomata of the rectum, and when localized are extremely favourable for curative operation.

" In a limited number of cases the sigmoid can be anastomosed to the lower rectum by the tube method after resection, but in a considerable percentage, and perhaps the majority, the disease involves the rectum extensively, and an operation cannot be considered complete which does not remove the entire rectum and lower sigmoid.

" Colostomy through the left rectus muscle, as advocated by Lilienthal, gives good functional results, and, as contrasted with a preternatural anus in any other situation, is to be preferred. A colostomy in the rectus muscle can be controlled by a simple abdominal binder—the weight of the abdomen in the bandage making the gentle pressure that is necessary for closure. The rectus muscle is as controllable as the biceps, and temporary voluntary control is often obtained, even against gas and fluids. Iliac colostomy, on the

contrary, is placed in a situation where pressure must be brought by a pad or some other artificial means; the control may be efficient, but generally does not bear comparison with that obtained when the opening is made through the rectus muscle.

" If the colostomy be done as a primary operation to be followed later by radical removal of the disease, it allows thorough evacuation of the bowels and careful cleansing of the distal fragment before undertaking the second operation. When it is considered that 90 per cent of the deaths following operation are due to sepsis, the importance of this step cannot be over-estimated.

" A sacral anus is fairly well controlled by proper apparatus, and the average patient is, for sentimental reasons, better pleased with a colostomy behind (and that after all is what a sacral anus amounts to), than with a colostomy in front.

" Carcinoma of the rectum and rectosigmoid remains a local condition until a late stage. The writer has never seen a case in which a locally removable carcinoma in this situation has been inoperable because of glandular metastases alone. Cases are not infrequently seen which are locally removable and fairly free from glandular metastasis, but in which the liver is involved in embolic carcinoma. This is especially true in the young. In a few instances there are peritoneal metastases and implantation carcinoma in the mucous membrane both above and below the primary seat of the disease in cases locally operable.

" In many cases rectal examination will not determine whether or not the disease be locally removable, and, since it is essential to know that there are no irremovable metastases in the abdominal cavity, an intraperitoneal exploration should constitute the first step in operating on cancer of the true rectum and rectosigmoid, and not until this be done and the disease viewed from above, can the question of rectal conservation be settled. This, however, should not be considered an arbitrary law. In the very obese, the cachectic, and those in poor physical condition from general diseases, a single operation by the perineal or sacral route may be preferred to a method which requires two operations, although an occasional patient may be operated upon radically who has abdominal metastasis unknown to the operator because unexplored.

" Inoperability is usually due to extension anteriorly to the region of the genito-urinary organs. When the mucous membrane of the bladder is affected and there is mechanical difficulty in micturition, an operation is not only futile but has also considerable mortality.

" Involvement of the peritoneum and muscular coats of the bladder is not unfavourable to operation, and on a number of occasions the reporters have removed a part of the bladder wall down to the mucosa, with good results. Involvement by direct extension to the uterus does not mean inoperability. If necessary, the uterus with both ovaries and tubes can be removed at the same time. This was done in five of the writer's cases. Carcinomata implanted upon the ovaries and pelvic peritoneum, however, are much less favourable for operation.

The very fact that these carcinomatous cells have been loose in the peritoneal cavity means that other organs may be involved, although, on account of the rapidity of the progress of the disease in the ovaries, they are the only organs manifestly affected at the time.

" The prostate and seminal vesicles, when involved in the carcinoma, can easily be removed to such an extent as may be necessary, but the prospect of cure is poor. In one patient an inch of the posterior urethra and a piece of the bladder were removed, followed by direct suture ; the prostate and right seminal vesicle were also removed. The patient recovered, with control of the bladder. The reporters have dissected the ureters from the bladder to the brim of the pelvis in a number of cases, and after covering them with vaseline, have allowed them to drop back into position. Ureteral fistula has not followed in any of these cases. They have found that if the ureters are thoroughly covered with vaseline after separation and denudation, both in this operation and the complete abdominal hysterectomy of Wertheim, ureteral fistula has not occurred. Gauze should not be allowed to come in contact with the denuded ureter in the drainage. It has been said that few cases of cancer of the rectum are operable beyond nine months after the beginning of the symptoms. This is an error. A number of cases in which the symptoms had existed more than two years proved to be in excellent condition for operation. Much of the reputation of colostomy as a palliative operation depends on the fact that cancer of the rectum is a slow process and long remains a local disease. These extensive operations, however, can only be made with a justifiable mortality where a preliminary colostomy has been done and the rectal fragment has been carefully cleansed."

For statistical consideration of operative methods and immediate mortality, the 71 cases were divided into two series : (1) Operations through the perineum, or a posterior sacral incision in a single stage. In this series there were 27 cases, with 2 deaths (7 per cent) ; (2) Abdominal and abdomino-combined operations in one or two stages. This series contained 44 cases, with 9 deaths : abdominal and abdomino-perineal operations in one stage, 14 cases, with 5 deaths ; preliminary colostomy with secondary posterior resection, 30 cases, with 4 deaths. There were a number of cases in this second group in which acute, subacute, or chronic obstruction existed, and the majority, because of adipose tissue, cardiovascular changes, nephritis, etc., were poor surgical risks.

In commenting on these figures, Mayo writes : " We are encouraged in contrasting the histories of these 71 cases with those of the 120 cases previously reported. While no one operation can be applied to all cases, and while more or less incomplete operations are sometimes found necessary because of the condition of the patient, the last two years have witnessed wider extirpation and more extensive operations generally. These now include an important group of cases heretofore considered hopeless. The two most important factors in these results are : first, elimination by means of preliminary abdominal exploration

of cases of abdominal metastasis which would otherwise be subjected to unavailing and dangerous operations; and second, the acceptance of permanent colostomy, sacral or abdominal, as a necessary evil in the majority of cases.

"In the 120 cases previously reported, the mortality was 16 per cent. In the present group of 71 cases the mortality is about the same (15·5 per cent), due to the acceptance for operation of cases which previously would have been considered hopeless.

"In contrasting the various methods of operation, it can be seen that the operations grouped under series 1 give the smallest mortality. In the elderly, in the very obese, and in poor surgical risks, operations in one stage through the perineum, or posteriorly (sacral), should be practised. The sacral operation, either as a primary operation or as the second stage of the abdominosacral method, is the operation of choice for the actual removal of the rectum. The great advantage of this particular operation lies in the fact that the disease can be extirpated widely at a single operation if necessary. In over half of the 191 cases, this type of operation was performed as a primary operation or as the second stage of the abdominosacral method.

"The abdominoperineal combined method performed at a single operation is perhaps the ideal one. I am confident that were this method applied to all cases the mortality would be reduced one-half. It must be taken into consideration that the fourteen cases subjected to operation in this series could not be done in any other way, and were otherwise hopeless. The upper rectum and lower sigmoid were involved nearly to the promontory of the sacrum. In all, a complete dissection of both ureters was necessary. Four of them had been operated previously, and a colostomy made because they were considered hopeless. In two, a loop of adherent small bowel was coincidently resected, and in two the uterus was involved and removed. Are operations justifiable in carcinoma advanced to this degree? Our experience leads us to believe that they are—we have a number of five-year cures in the twenty-six cases of abdominal and abdomino-combined operations in one stage in the previous series of 120 cases reported in 1910.

"The combined abdominosacral operation in two stages has much to commend it, and has a mortality of less than one-half that of the abdominoperineal combined operation in one stage. The ability to cleanse the lower fragment, and the relief of obstruction which a preliminary colostomy makes possible, are of the greatest importance. This method also permits the removal of tumours of the most extensive description from the rectum proper, a situation to which the abdominoperineal combined operation affords insufficient access. The rectum can be dissected by the sacral route with as much precision as in the cadaver, and it is a suitable procedure for practically all growths of the rectum and rectosigmoid. Its greatest advantage lies in the fact that if a temporary colostomy be made to divert the fæcal current until satisfactory union of the upper and lower fragments has taken

place, in suitable cases complete restoration of normal function can be confidently expected.

"We are to-day operating upon cases which three years ago we would have considered entirely beyond the reach of surgery, because experience has shown that cancer of the rectum long remains a local disease, and by block dissection cure can be obtained in a goodly percentage of cases."

References.—[1]*Brit. Med. Jour.* 1912, ii, 852; [2]*Ann. Surg.* 1912, ii, 240.

RELAPSING FEVER. *Leonard Rogers, M.D., F.R.C.P.*

Treatment.—N. Svenson[1] reports the use of **Salvarsan** in the treatment of relapsing fever in Russia, where it is an important disease. The ages of the patients varied from fourteen to fifty years. Out of 26 cases treated by the intravenous method, 23 remained completely free from relapses. In three patients who had relapses, two had been given subcutaneous injections, and the third too small a dose intravenously. He considers that salvarsan produces a "therapia magna sterilizans," as Ehrlich claimed, and is very useful in relapsing fever. The mode of action is not clear, for it is not directly bactericidal *in vitro*, even in 1–150 solution, while producing very little effect on the motility of the organisms even after four to six hours.

N. Remesow[2] has treated 135 cases with salvarsan with very favourable results, a crisis being rapidly brought about and relapses prevented. The intravenous method is the more effectual. The presence of traces of albumin in the urine does not contraindicate the treatment. P. P. Smirnoff[3] has given the drug in 240 cases, and obtained excellent results, especially by the intravenous method; in 201 cases, relapses occurred only in 30, or 8·45 per cent, in only 2·48 per cent of which were spirilla found in the blood. He regards the intravenous use of the drug as a certain and rapid curative measure.

References.—[1]*Münch. med. Woch.* 1911, 2549; [2]*Ibid.* 2215; [3]*Deut. med. Woch.* 1912, 748.

RENAL TUBERCULOSIS. (*See* Tuberculosis, Renal.)

RETINITIS, EXUDATIVE. *A. Hugh Thompson, M.D.*

Under this designation a case observed during sixteen years is described by Coats.[1] When first seen at the age of twenty-nine, the failure of sight in the affected eye was recent, and a dense white deposit composed of confluent spots was seen in the lower macular region, with hæmorrhages at the fovea, and some similar white spots on the nasal side of the retina. At intervals, fresh exudations in various parts of the retina have been observed, apparently commencing with hæmorrhage and becoming absorbed after a time. No important changes in the vessels themselves have ever been made out, and the affection has remained confined to one eye. There is a total absence of any discoverable general disorder which might account for the ocular condition.

Similar cases are not uncommonly observed in ophthalmic clinics, but it is seldom that a case can be kept under observation for so long a period, and this one is especially worthy of record from the point of view of prognosis. When first seen, the sight of the affected eye was $\frac{6}{60}$, and sixteen years later it was still $\frac{3}{60}$.

Reference.—[1]*Ophth. Rev.* 1911, 289.

RHEUMATISM. (*See also* Rheumatism in Childhood, *and* Rheumatoid Arthritis.) *Herbert French, M.D., F.R.C.P.*

Magnesium Sulphate, administered by intramuscular injection, is advocated strongly by A. B. Jackson[1] in the treatment of acute rheumatic fever. He prefers this even to salicylates, and states that the beneficial effects are marvellous. He does not say whether the endocarditis and other heart complications of acute rheumatism are minimized by it, but states that rheumatic tonsillitis is benefited as materially and rapidly as are the joint pains. The drug does not appear to purge when given intramuscularly. How it acts upon the arthritis is not known. The technique is simple: an all-glass hypodermic syringe of 5 c.c. capacity is employed, all aseptic precautions being observed; the magnesium sulphate is made up in a 25 per cent sterilized solution, of which the dose is 4 c.c. for an adult. This is repeated once a day, and is seldom needed for more than three days. The injections prove painless; they are made either into the buttock or into the infrascapular region. It is stated that there are no untoward effects of any kind.

T. Harvey Thompson[2] has found the following application, used twice daily, very efficacious in the treatment of obstinate rheumatic and sciatic pains:—

℞	Menthol		Chlorof.	℥ss
	Camphoræ		Tinct. Capsici	℥j
	Ol. Terebinthini		Methyli Salicylatis	℥j
	Ol. Eucalypti	āā ℥ss	Paraffin. Liq.	ad ℥vj

The capsicum in the above prescription is a very important ingredient.

J. Edwards[3] finds the best application for the chronic rheumatism prevalent amongst police constables to be the following:—

℞	Ichthyol	℥j	Vaselini	ad ℥j
	Lanolini	℥ij		

Misce. Fiat Ung.

W. Knowsley Sibley[4] finds that psoriasis, especially the rather acute first attacks in young subjects, is not uncommonly accompanied by distinct rheumatic phenomena, and will yield satisfactorily to active anti-rheumatic treatment. **Salicylates** in young people and **Iodide of Potassium** in older ones will often clear up the eruption of psoriasis.

He draws attention to a condition described under the term "dermatalgia," or "rheumatism of the skin," characterized by patches of hyperæsthesia, usually occurring in some of the hairy parts of the body in middle-aged women. Nothing is to be seen on the skin

itself, but the pain may be of a burning, pricking, shooting, or boring character, generally worse at night. Movement or the slightest contact may excite a severe attack. Firm pressure will sometimes relieve it. Anti-rheumatic remedies should also be prescribed according to the circumstances, the frequent applications of **Radiant-heat Baths** or the **Hot-air Douche** to the affected regions being particularly beneficial in some cases. **Blistering,** the application of tincture of **Aconite** root, or the tincture of **Belladonna,** or painting on of equal parts of **Chloral Hydrate, Camphor,** and **Menthol,** or **Galvanism,** will all be of palliative use. Frequently, after several weeks the pain will disappear spontaneously.

John Ritchie[5] is a supporter of Percy Wilde's method of treating acute and chronic rheumatism by means of the "**Hot Moist Blanket Pack.**" The following is the technique employed: Four single dry blankets are laid in order upon the bed, and upon these a large waterproof sheet long enough to extend from above the shoulders of the patient to about eight inches beyond his feet. The patient is undressed, and rapidly rolled up in a blanket which has been tightly wrung out of hot water. The dry blankets are then separately packed round the body. A cold compress on the forehead may be needed. A hot bottle at the feet may assist in producing perspiration; so also will a hot drink. Perspiration should begin in about half an hour; when it is fairly established the blankets are removed, the patient is rapidly sponged with tepid water, briskly dried, re-dressed, and covered with ordinary blankets.

This method was only recommended by Percy Wilde for cases where no appliances are available. At the Lansdown Hospital, Bath, special apparatus is used to produce the same results, viz., to produce an artificial pyrexia which Wilde claims to be the natural agent for destroying the products of defective metabolism both in gout and rheumatism.

C. Gayford[6] lays stress upon the value of a combination of **Salicylic Acid** with the **Alkaline Acetates** in the treatment of the acute forms of rheumatism; he prescribes the salicylic acid in suitable doses in liquor ammonii acetatis, together with a little belladonna.

The **Bee-sting** treatment of articular rheumatism is regarded by T. Duncan Newbigging[7] as mere humbug. He has tried it repeatedly. He is himself an extensive bee-keeper, and is constantly being stung, yet he suffers severely from pure articular rheumatism. He advocates the use of **Dilute Acetic Acid** as an external application, not only to the affected joints, but also to the whole body, with the exception of the face.

I. J. E. Renshaw,[8] after an experience of upwards of thirty years, finds the best treatment for *lumbago* to be as follows: Put the patient to bed in warmed blankets; apply to the painful area a **Belladonna Plaster,** being perfectly sure it is therapeutically efficient. Give every three hours 10-min. doses of **Tinct. Bryoniæ** B.P. in chloroform water. Correct the diet by excluding all forms of animal food and

reducing the drink to milk and water, equal parts, boiled together. If constipation is present, treat with pil. rhei co. If necessary, the teeth must have attention. The patient resumes duty at the end of eight days, having lost all pain in thirty-six hours. Renshaw thinks bryonia is a specific in this disorder when used in the manner indicated.

Rheumatic *affections of the eye* are benefited by the use of drugs of the salicylate group, and of the latter **Acetyl-salicylic Acid** is the best for the purpose, according to J. Allan.[9]

A. Maclennan[10] goes so far as to advocate the use of the knife in the treatment of acute rheumatism in certain cases. His view is that in many cases an acute rheumatism is ushered in by a localized lesion which lasts long enough for **Operation** to be adopted; whilst if it is left it is from this lesion that a more generalized infection takes place, and one which might have been prevented by operative procedures. He is subject to acute rheumatism himself, and he has been so impressed by the success of operation in these cases that he always resorts to early incision when he himself is attacked by it. The treatment is unusual, to say the least of it, but it would be well worthy of general adoption if the cardiac complications of rheumatic fever could be lessened thereby. Briefly, operation consists in drainage, either of the infected joint or the infiltrated cellular tissue. In some cases the micrococcus may be found readily in the smear of the blood from the incision. In most cases drainage is quickly followed by cessation of pain. Wet dressings are applied, and the application of a Bier's bandage is beneficial. At the time of operation the serous exudate should be massaged out of the wounds as much as possible. Short multiple incisions are better than the more heroic. A joint may require washing out and more or less prolonged drainage. In a few instances he has found it advisable to erase the joint, but in those cases the infection was probably rheumatoid, though at no time pyogenic. For the treatment of rheumatic nodes, periteno-vaginitis crepitans, etc., he says that incision acts with wonderful effect. One is not absolutely sure that Maclennan's cases were really suffering from acute rheumatism in the accepted sense of that term, but he himself speaks of them as sufferers from acute rheumatism.

Massage in the local treatment of neuralgias—supra-orbital, auriculo-temporal, occipital, and so forth—is advocated strongly by C. W. Williams,[11] who also emphasizes the fact that the existence of palpable pathological changes should be sought for in or about the affected nerve in all neuralgic cases. Such changes are to be detected on careful palpation more often than is generally supposed.

Great benefit is obtained in many cases of so-called *chronic rheumatism* by the passage of large **Electric Currents** through the affected part. The following is the technique advocated by J. R. Riddell[12]:—

Either place two well-moistened pads one on each side of the affected part, or place the limb (e.g., the foot and leg) in a tub of hot water. Enfold the knee joint and the limb immediately above it in many folds

of thoroughly moistened lint, over which apply the electrode, which should be made to encircle the limb. One pole is attached to the encircling electrode and the other to the tub. Great care must be taken that the lint presses evenly all over, for if the contact be firmer at any one point than elsewhere the current will concentrate there, and cause necrosis of the skin. The electrode should be made of some flexible material, such as copper gauze, which can be moulded accurately to the part. It is immaterial which pole is made positive. The current should be turned on and increased very gradually; in the course of four or five minutes it may be slowly raised to 50 or 60 milliampères or even higher. The sitting should last at least half an hour, and may be repeated twice weekly. A course should consist of anything from twenty to thirty sittings, and should be repeated after an interval of a few months. The treatment should be *painless*.

W. C. Wolverton[13] recommends the use of **Polyvalent Streptococcal Vaccines** in the treatment of acute rheumatic polyarthritis. He records six cases in which very severe joint pains were permanently relieved by them within two days. He uses a stock vaccine, prepared from streptococci derived from six different sources, and gave a dose of 30,000,000 killed micrococci for the first dose, and 60,000,000 for the second and third doses at intervals of three days. He suggests that the incidence of heart lesions may be minimized greatly in this way. The diagnosis was not verified bacteriologically in his cases, and it is possible that not all the patients had the same kind of joint malady; but there was no ill-effect from the vaccine, the joint pains, previously very bad, were rapidly and permanently relieved in all the cases, and the treatment seems worthy of more extended trial.

Carey Coombs[14] summarizes the *cerebral symptoms* exhibited by the subjects of acute rheumatism. Chorea is the commonest; much rarer are delirium, convulsions, stupor, coma, hyperpyrexia, which constitute the severer group of cerebral symptoms in rheumatic cases, whilst a milder group include temporary monoplegia, hemiplegia, or paraplegia, hemianæsthesia, segmental anæsthesia of a limb or limbs, transitory extensor plantar reflex, incontinence of urine, hippus, transient diplopia, and mild psychical disturbances. He comments on the rarity of hyperpyrexia nowadays as compared with formerly, and attributes this to the use of salicylates and hydrotherapy. He advocates **Chloretone** in doses of 4 to 8 gr. three times a day if there is sleeplessness in association with chorea; or **Trional** in a single dose of from 5 to 20 gr., or in smaller repeated doses. He also commends the use of repeated **Hot Packs,** especially if the movements are violent. In mild cases he advocates **Sodium Salicylate, Rest in Bed,** and **Feeding.** He does not think that arsenic or antipyrin do good in chorea.

Chloretone is also advocated by J. Ross MacKenzie[15] in the treatment of chorea. He gives it in addition to the remedies employed in other rheumatic conditions. In severe cases he prescribes it in doses of 3 to 5 gr. three times a day for three days, twice a day for three days, and once a day for three days, to be given in milk or emulsion, and it

certainly has a marvellous action in calming the nervous system, controlling violent movements, and producing sleep. (*See also* CHOREA.)

J. Lewes Timmins[16] advocates combined treatment by **Ionization** and **Bier's Hyperæmia** in various conditions which he groups together under the general term "rheumatic." He finds ionization, in cases of *muscular rheumatism, lumbago, intercostal neuralgia,* and *myalgia of the shoulder-blades and neck,* acts like a charm. Iodine is the best reagent, sodium salicylate next. The results in joint cases are less certain and satisfactory than those obtained in the myalgias. The technique that he finds most suitable is as follows :—

The apparatus required is simple and easily managed : a constant-current battery capable of giving a current of 80 to 100 ma. and fitted with a galvanometer with readings, 1–10 and 1–100. For terminals he uses "pot cloths," which are loose-woven hemp cloths having a continuous copper ribbon woven into the cloth ; they are obtainable of most ironmongers. These cloths are 6 in. by $5\frac{1}{2}$ in. in size. To render them serviceable a piece of moderately stout pliable copper wire is sewn with fine copper wire along the edge of the cloth, leaving about 4 in. of wire projecting from the cloth at one side, the other side being cut off flush with the edge. To the end of the wire is secured a small connecting nut ; the male piece of this nut should be pierced to receive the terminal from the battery, also a thumb-screw to secure the same. Two sizes of cloths are necessary, a pair $5\frac{1}{2}$ in. by 6 in., and a pair double this size made by sewing two cloths together with fine copper wire ; intermediate sizes can be made by folding the cloths. Terminals can be made from fine copper gauze, but they are not so pliable as the cloths.

To apply an electrode to the surface of the body, it is necessary to have a thick pad of cotton material between the skin and the electrode. Timmins uses plain Gamgee tissue. The pad must not be less than four thicknesses of the material when large currents are given, and they must be cut with an ample margin beyond the electrode in each direction, at least an inch for safety. The mode of application is very similar for each of the classes of case under consideration. The surface of the skin over which the application is to be given should have been well washed, and free from all grease and medicaments. The pad is soaked in a 2 per cent solution of the drug to be given, and is then laid evenly over the skin, the electrode is placed accurately over this, and the whole bound on with a broad bandage. The pad should be so wet that some solution is squeezed out when bandaging. The other electrode, which must be of equal size, is placed on an area of skin not far from the other. When a limb is being ionized, both pads can be placed on the same limb ; it is better not to cross the middle line of the body. When the pad is applied to the trunk the electrodes should be so placed as to distribute the current equally on the two sides. The pad of the non-active electrode is soaked in a 2 per cent solution of either common kitchen salt or sodium bicarbonate.

The pads having been applied, connection is made to the battery. The correct pole for the drug used must be connected to the active electrode. In choosing the pole it is necessary to bear in mind that the ions of the metals travel from the positive to the negative pole, and those of the acid radicals, bases, and halogens travel from the negative to the positive pole. When iodine-sodium salicylate and sodium chloride are the drugs used, the active ions are influenced by the negative pole, and it is this which must be connected to the active electrode, and the positive to the non-active. The connections having been made secure, the current is turned on slowly until the required milliampèrage is reached, and kept at that for the duration of the application, when it is slowly turned off, the pads removed, and the skin dried. When iodine has been used, some lanolin should be applied to the skin. Timmins has found the following current strengths and time of application to be most convenient: —

Iodine.—15 to 40 ma. for ten to twenty minutes, according to the size of electrodes used; and also according to the tolerance of the application by the patient, which should be taken into account when using iodine. If the patient complains of inordinate burning, the current should be reduced and the time shortened. The solution for this drug is obtained by making a 2 per cent solution of potassium iodide, and adding about 30 drops to the pint of liniment of iodine.

Sodium Salicylate.—30 to 60 ma., according to the size of electrode used, for twenty minutes.

Sodium Chloride.—40 to 80 ma. for twenty to thirty minutes.

The sittings for iodine should be given at an interval of not less than a week; when the skin reaction has been great, ten days may be allowed. For sodium salicylate and sodium chloride, five to six days' interval will be sufficient.

In treatment, one to six applications of iodine will generally suffice; of the salicylates a few more will be required; while for the solvent action of sodium chloride on stiffened joints, and using a bigger current, one to many applications may be necessary.

Warning.—Great care must be taken that every abrasion of the skin under a pad is amply protected. A small piece of batiste stuck on with vaseline will be sufficient. The pad must project in every direction beyond the electrode. Should the electrode or its wire be in contact with the skin, a serious burn will result. All connections must be secure, to prevent severe shock. The galvanometer must be watched constantly, so as to keep the current at an even ampèrage.

As part of the course of treatment, Timmins gives a series of **Hot-air Baths** or **Hot-air Douches,** the application being given midway between the ionizations. It is also an advantage for the patient to have **Massage** twice weekly; the rubbing must be gentle over the joints and muscles affected; no liniments are required.

To give the hot-air baths the operator should be provided with Bier's hot-air apparatus: one box for the knee-joint, and one for the shoulder; the former will serve for the foot, leg, and knee, also the

upper limb as far as the shoulder. It is necessary also to have a hot-air nozzle which fits on to the spirit-heating apparatus. When giving a bath the part treated must be wrapped in asbestos wool. The temperature, measured by a suitable thermometer, should be raised to 260° F. and for a short time may reach 270° F., and in some cases 280° F. With elderly patients 240° F. is sufficient. Half an hour after the thermometer registers 180° F. to the time the heat is turned off is long enough for a bath. When using the nozzle the current of hot air should be directed on to a small area of skin, and kept moving slightly in a circular way, and should be continued until the part is hyperæmic and sweats profusely; when this takes place this area of skin should be covered up, and the next areas be taken. The hot-air douche is more suitable for the trunk, buttock, and neck. After a hot-air bath or douche the patient must be well covered up; the limbs should be enclosed in a thick flannel bandage.

The treatment by ionization and hot air takes much time and patience, but the results amply repay the trouble taken.

[For article on "Ionic Medication," see also MEDICAL ANNUAL, 1912.]

H. Drinkwater[17] advocates the use of **Sodium Salicylate** in the treatment of *rheumatic tonsillitis*, but advises that it should be prescribed along with perchloride of iron when there is any pallor of the pharynx. The prescription is as follows:—

℞	Sod. Salicyl.	ʒj	Pot. Bicarb.		ʒj
	Liq. Ferri Perchlor.	℥ss	Aq.	ad	℥viij

Misce. Dose: ℥j.

Certain precautions are essential in making up the prescription. The iron *must* be mixed with the salicylate before the potash is added to *either* of them, otherwise an insoluble ferrous carbonate is formed and CO_2 is given off. The salicylate of soda and the potash should each be dissolved in water before being put in the mixture; then, if the ingredients are introduced *in the order given in the prescription*, the final result is a clear claret-coloured mixture without a trace of deposit or effervescence. The iron and salicylate form a thick curdy purple precipitate, which dissolves on the addition of the potash. Theoretically, 218 gr. of sodium salicylate are equivalent to the iron in 1 oz. of the liquor ferri perchloridi, but, practically, not more than one quarter of this amount of iron can be used, otherwise the mixture will effervesce when the bicarbonate is added The rectal administration of sodium salicylate is alluded to on *page* 41.

E. Mansel Sympson has found **Acetyl-salicylic Acid** of great value in so-called "*muscular*" forms of rheumatism, lumbago for instance, especially that kind which is apt to attack golfers. He generally gives it in 15-gr. doses in cachets three or four times a day, warning the patient to take no soda or alkaline water within four or five hours after each dose. For relieving the pains of chronic rheumatism and osteo-arthritis he supplements the acetyl-salicylic acid with **Solurol** (thymic or thyminic acid), with good results. For external use in

these cases he prefers a liniment of equal parts of gaultheria oil and some simple oil such as parolein or the officinal liquid paraffin.

The following are also recommended in the treatment of rheumatic disorders : **Melubrin,** a new salicyl compound (*page* 23), a lotion containing **Uranium Oxide** (*page* 70), **Radio-active Baths** (*page* 70), and **Combined Glandular Extracts** (*page* 30.)

REFERENCES.—[1]*Pract.* 1912, 177; [2]*Ibid.* 203; [3]*Ibid.* 202; [4]*Ibid.* 204; [5]*Ibid.* 207; [6]*Ibid.* 209; [7]*Ibid.*; [8]*Ibid.* 210; [9]*Ibid*; [10]*Ibid.*; [11]*Ibid.* 212; [12]*Ibid.* 214; [13]*Med. Rec.* 1911, 868; [14]*Pract.* 1912, 99; [15]*Ibid.* 211; [16]*Ibid.* 336; [17]*Ibid* 201.

RHEUMATISM IN CHILDHOOD. (*See also* CHOREA, *and* RHEUMATISM.)

Frederick Langmead, M.D., M.R.C.P.

ETIOLOGY.—It is now considered by many that acute rheumatism is an infective disease which is especially prone to attack children. About the causal organism opinions are still divided, but the work of Poynton and Paine, who ascribe it to a diplo-streptococcus, called by them the *Micrococcus rheumaticus,* is gradually winning acceptance among those who are best able to judge. These authors have isolated the organism from the tissues and blood of rheumatic patients, have cultivated it on nutrient media, and by inoculation into animals have reproduced lesions identical with those of rheumatism. Further, they have isolated the organism from the blood and tissues of the infected animal in pure culture. This work has been corroborated by others. The mode of entry of the micro-organism requires further research.

J. Ross Mackenzie[1] believes the throat to be the most frequent and important channel of infection. As he points out, a relationship is at once suggested by the large percentage of children suffering from rheumatism who have also enlarged tonsils and adenoids. He thinks that the micro-organisms may remain localized in the tonsils or pharynx, producing toxins which obtain entrance into the blood in variable quantities at irregular intervals, thus accounting for the erratic behaviour and latency of the rheumatic manifestations. In the absence of tonsils and adenoids, there may be inflammatory congestion of the soft palate, pillars of fauces, and pharynx in an early stage of the disease. From such a throat Poynton has isolated the micrococcus.

Although in many cases the lymphatic glands at the angle of the jaw are enlarged, he believes that this is due to tonsillar infection other than rheumatic. In purely rheumatic infection these glands are not enlarged. This fact, together with the evidence that the micrococcus has an affinity for the endothelial cells lining the capillary blood-vessels, and the sudden onset of acute rheumatism when the infective agent comes in contact with an injured surface, all favour the view that general infection is by the blood-stream and not by lymph channels.

He records the cases of four children whose tonsils were removed. None had shown any evidence of rheumatism other than occasional attacks of sore throat and growing pains. The tonsils, on removal, were put into sterile bottles, and a piece from the centre of each was

inoculated in broth. Each yielded an almost pure culture of the *Micrococcus rheumaticus*.

Mackenzie suggests that other modes of entry or sources of local infection may be the bronchial tubes and the intestinal walls. During a recent epidemic of measles, he has observed several cases where prolonged convalescence was complicated by varied combinations of multiple polyarthritis, cardiac dilatation, anæmia, and erythema nodosum, with slight rise of temperature and some bronchial catarrh. In favour of an occasional local infection of the intestinal wall by the organism of rheumatism, he describes certain cases where mucous colitis is accompanied by muscular or articular pains. All treatment for the colitis proved fruitless until it was combined with anti-rheumatic remedies.

Treatment.—In recent years more attention has been paid to the throat in rheumatic cases. If Mackenzie's view of the paths of rheumatic infection be correct, then the prophylactic treatment which he recommends is of first importance. To obviate infection by the throat, hypertrophied adenoid tissue in the throat and nasopharynx should be removed in the quiescent stage, and simple congestion in a child with a family or previous history of rheumatism should be regarded seriously and combated by **Local Applications of Salicylic Acid** preparations, together with **Sodium Bicarbonate, Sodium Salicylate, Potassium Chlorate,** and **Aperients** internally. He advises the local application of a 5 or 10 per cent solution of sodium salicylate, or a gargle containing gr. 20 to 40 to the oz. Decayed teeth should be attended to, and the teeth should be properly cleansed daily.

Inhalation for half an hour, three times a day, of 10 min. of a solution of equal parts of **Creosote** and **Carbolic Acid,** using a Burney Yeo inhaler, is in his opinion the best method of protecting the pulmonary mucous membrane.

As a prophylactic measure against intestinal infection, he has found that **Sodium Salicylate** combined with **Sodium Bicarbonate** and **Rhubarb Powder** is the most useful.

Reference.—[1]*Brit. Med. Jour.* 1912, i, 1232.

RHEUMATOID ARTHRITIS. (*See also* Rheumatism, *and* Spondylitis, Traumatic.) *Herbert French, M.D., F.R.C.P.*

Etiology.—The view that not a few cases both of acute and of chronic synovitis and arthritis are really due either to *tubercle bacilli, or to tuberculo-toxins* without actual bacilli, was first enunciated clearly by Poncet in France. A recent exponent of Poncet's views is H. H. M. Lyle.[1] The lesions in question are quite distinct from those which are the familiar manifestations of active tuberculous pulpy joints; they closely resemble either rheumatic fever in the acute cases or rheumatoid arthritis in the subacute or chronic.

Arthralgias.—The myalgias, hyperæsthesias, and neuralgias of tuberculous patients are well known. These " algias " are probably caused by the tuberculous toxins.

To the indefinite rheumatoid pains met with in tuberculous patients, Poncet gives the name tuberculous arthralgia. These pains as a rule are light, show a tendency to shift, and have a predilection for the larger joints. They may be the first warning of a latent tuberculosis, and suddenly vanish upon the appearance of an active tuberculous lesion ; again, they may develop into a true tuberculous arthritis. They are frequently mistaken for growing pains or for tuberculous arthritis ; this latter mistake undoubtedly accounts for some of the marvellously rapid cures of tuberculous hips and spines. A knowledge of the possibility of their relation to tuberculosis is invaluable.

Acute or Subacute Tuberculous Rheumatism.—This form is characterized by the rapid involvement of one or several articulations, giving rise to a more or less perfect picture of an acute rheumatism : it may be primary, or secondary to a visceral tuberculosis. From the nature of things the primary form is exceedingly difficult to diagnose. A grave general condition with a moderate involvement of joints is a presumption in favour of tuberculous rheumatism.

The secondary form has a variable prognostic value. In this connection it is interesting to note that there is very clear and constant relationship between the visceral and articular attacks ; when one advances the other recedes. The use of the salicylates in tuberculous rheumatism is not only valueless but may be harmful. In nearly all the cases which have had repeated attacks of tuberculous rheumatism, the pulmonary tuberculosis is of a fibroid character and advances very slowly.

Chronic Tuberculous Rheumatism.—This is encountered more frequently in the second period of life, and may be primary, or secondary to repeated attacks of acute tuberculous rheumatism. Four clinical varieties are distinguished. They may occur independently, or be found side by side in the same individual. (1) Deforming tuberculous polyarthritis. This is the ordinary arthritis deformans or rheumatic polyarthritis most often met with in young people and not infrequently in children. Poncet gives radiographs which show that there is a certain rarefaction at the ends of the bones. The diagnosis depends on the history, the sero-reaction, the presence of tuberculous lesions elsewhere, and the future developments. (2) Chronic tuberculous polysynovitis. In this form the toxin seems to limit itself to the synovia of the tendon sheaths and articulations ; there is no bony involvement, and articular deformities are lacking. All varieties in all stages of virulence may be found in the same patient : plastic synovitis, serous synovitis, purulent synovitis, etc. (3) Dry senile arthritis. As described by Poncet, this is the type of arthritis deformans which we see in old people. (4) Ankylosing tuberculous rheumatism. True rheumatism never leads to an ankylosis. Poncet states that a spontaneous ankylosis is the result of an infection which involves the ligaments or the bones ; but one structure is never involved to the exclusion of the others, and between the extremes all transitional forms occur.

It is the current opinion that gonorrhœal rheumatism presents in the greatest degree the power of producing an ankylosis without the formation of pus. Poncet challenges this ; according to him, many of the so-called ankyloses are tuberculous, and he calls particular attention to the different varieties of ankylosis in the spinal column.

Ankylosing tuberculous rheumatism is associated with a mild chronic visceral tuberculosis rather than with an active process, and a careful search is often required to demonstrate these latent lesions. As a rule there is a tuberculous family history, or a history of prolonged exposure to such an infection ; sex seems to have no influence ; children are often attacked ; the vertebral form is confined to maturity and old age.

There are two clinical forms : monarticular and polyarticular. The monarticular form occurs in the larger joints, most often the hip or knee. The process of ankylosis may be rapid, without intermission ; at completion all pain ceases. Again, the process may be gradual but irregular, with improvements and relapses, terminating usually in a complete ankylosis. The onset of the polyarticular form may be insidious or brusque, with chills, fever, sweating, and rapid loss of weight. Several articulations may be involved ; the pain and tenderness persist for a considerable period after the subsidence of the onset symptoms ; there is a great tendency for the parts to assume faulty positions, and the end result may be a fibrous or bony ankylosis.

One cannot help feeling that there is a great deal in Poncet's teaching, and one is reminded that Sir Andrew Clark long ago drew attention to " hæmoptysis occurring in arthritic subjects." He regarded this hæmoptysis as non-tuberculous, but it seems quite possible that it was evidence of latent phthisis, the joint lesions also being due to tubercle toxins. At the same time, it must often be difficult to decide whether internal tuberculosis is responsible for joint manifestations in any given case ; there may be also a danger of " overdoing " Poncet's views, and of attributing to tubercle toxins joint lesions that are really due to other micro-organisms.

The relation of diseases of the mouth to rheumatoid arthritis formed the basis of extensive clinical and bacteriological researches by Kenneth Goadby.[2] He insists that rheumatoid arthritis is an infective disease, due to micro-organisms that may have many different primary foci of absorption, amongst which he quotes such local inflammations as chronic appendicitis, tonsillitis, chronic antral, ethmoidal, or frontal sinus disease, endometritis, chronic colitis, and so forth ; and he is very far from saying that all, or even most, cases are due to local infective troubles in the mouth. At the same time he is strongly of the opinion that the absorption of micro-organisms, either from actually carious teeth, or from infected gums or jaw alveoli in some cases in which the teeth themselves may appear perfect, is responsible for a very large number of cases of troublesome rheumatoid arthritis. He describes the *Streptobacillus malæ*, which he believes to be the causal organism, and describes experiments in which he has produced rheumatoid

arthritis in animals by inoculating the latter with living cultures of *Streptobacillus malæ* from a human source.

Diagnosis.—The value of the *x*-rays in establishing a differential diagnosis between rheumatoid arthritis and osteo-arthritis is discussed at *page* 57.

Treatment.—The possible importance of Goadby's work in treating rheumatoid arthritis due to oral infection by means of vaccines prepared from *Streptobacillus malæ* cultures is considerable; he describes one case in which this **Vaccine Treatment** was effective. He lays stress upon the fact that the focus of infection in the mouth is not always obvious at first sight; it may be very real, and yet difficult to find without thorough search.

A. P. Luff[3] advocates **Guaiacol Carbonate** in the treatment of rheumatoid arthritis. He insists on the need for differentiating the malady carefully from acute rheumatism, gonococcal arthritis, septic arthritis, tuberculous arthritis, syphilitic arthritis, osteo-arthritis, and particularly from gout. He remarks that rheumatoid arthritis in its earlier and more curable stages is often regarded as gout and treated by a lowering diet, when, for true rheumatoid arthritis, the diet should be as liberal and as good as the patient can digest, and animal food be partaken of freely, though not to the exclusion of vegetables. A moderate quantity of wine or stout should be taken with lunch and dinner. Any kind of wine that agrees with the patient may be taken, but perhaps a generous red wine is the most suitable.

He has employed guaiacol in several thousands of cases, and as the result of his experience he does not hesitate to say that, if administered in sufficient quantities and for a sufficiently long period, it is capable in the great majority of cases of arresting the disease, of diminishing the size of the joints, and of permitting increased movements. It also relieves pain markedly. It is useful in both the subacute and chronic forms of rheumatoid arthritis. The guaiacol probably acts by inhibiting the growth of the specific micro-organism in the intestinal tract, and after absorption, by combining with the bacterial toxins and assisting in their elimination.

The most convenient form of administering the guaiacol is the carbonate in cachets. At first from 5 to 10 gr. should be given three times a day, and the dose should be increased by 1 to 2 gr. each week until from 15 to 20 gr. are being taken in each dose. It is essential that this treatment should be continued for at least twelve months. The beneficial effects of the guaiacol are increased by administering at the same time a mixture containing 10 gr. of **Potassium Iodide** in each dose; the depressing effect of the iodide should be counteracted by its combination with tonics.

The treatment just detailed is, in his experience, incomparably superior to the prolonged treatment of such cases with small doses of arsenic and iron, a method which still has many supporters.

In the early stages of those forms of rheumatoid arthritis which are associated with Raynaud-like symptoms and cramps in the extremities,

he considers **Thyroid Extract** to be of great value, but he has not found it of any appreciable service in the later stages.

In cases in which the joints have become more or less fixed by fibrous adhesions and by fibroid thickenings of the synovial and peri-articular tissues, he says that **Fibrolysin** is of great use in effecting a softening of the fibrous thickening, and if this is followed by massage of the affected parts the thickened tissues stretch and undergo absorption.

In arthritis secondary to a chronic colitis, **Irrigation of the colon** by the Plombières method will be found beneficial.

In addition to the above, he advocates thermal treatment of the affected joints by **Baths, Superheated Air,** or **Electric Light Baths ; Massage** and regulated movements, and residence in a **Dry, Warm Climate,** preferably away from the sea, Egypt being the ideal winter resort.

In speaking of **Vaccine Therapy** in cases of rheumatoid arthritis, T. J. Horder[4] insists strongly upon the danger of its falling into disrepute from the inadequate measures often taken to establish an even probable relationship between the supposed causal organism and the arthritis. If the arthritis is due to one micro-organism and the physician uses a vaccine prepared from some other organism simply because the latter happens to have been found elsewhere in the patient, clearly no good result can be expected. Nevertheless, this is what is being done far too frequently at present. Horder also insists that vaccines should be used in addition to, but not instead of, the other measures ordinarily employed. With these provisos he is an advocate of the use of vaccines ; he recommends that the dosage should be small at first and steadily increased, and he does not regard opsonic index estimations as of any real help in guiding the treatment.

Local Counter-irritation is coming into more general use again, one of its recent exponents being W. J. Midelton.[5] For many years he has relied on certain forms of counter-irritation, viz. : (1) Blisters, followed by the application of savin ointment to the raw surfaces. These he applies near the cervical and lumbar enlargements of the spinal cord. Also, if necessary, small blisters may be applied to affected joints. In this method a purulent discharge was aimed at and kept up for fourteen days as a rule. (2) Puncturing the skin with fine needles and immediately painting over the area thus treated a mixture of croton oil, cantharides, acetic acid, and almond oil. This procedure usually brings out an eruption of pustules which vary in size in different individuals. (3) The galvano-cautery ; light touches are made on the skin in the neighbourhood of the cervical and lumbar enlargements of the spinal cord and also of affected joints. Any one of the above, or a combination of all three, may be employed in the treatment of a single patient. Striking results have been obtained by such means.

The value of **Electricity** in the treatment of rheumatoid arthritis has been well established by many observers. Finzi[6] advocates it strongly under certain conditions. **Galvanism, Ionization, Faradism**

or **High-frequency Currents** may each be employed under appropriate circumstances. As Finzi points out, arthritic conditions often cause the muscles engaged in the movement of the affected joints to undergo a marked and rapid atrophy. The judicious application of faradism to the affected muscles will prevent deformities and often relieve pain. Even that form of rheumatoid arthritis which sometimes follows an injury is practically cured in many otherwise hopeless cases of this condition, for, though some deformity remains, the symptoms disappear, and, provided the disease has not gone too far, the functions of the joint are completely restored.

Other forms of rheumatoid arthritis vary a great deal in the amount of benefit they will derive from ionization. The type of disease is the chief factor, and a radiogram of the hands will give the best indication of this; the joint affected also makes a difference, for it is much more easy to get ions into a knee than into a hip joint. The knee is perhaps the most accessible joint, as there is a large area of synovial membrane close under the skin. That some ions do actually penetrate into the joint he has been able to prove by the following experiment:

A monkey having been anæsthetized, a solution of potassium ferricyanide was placed on the front of one knee joint under the negative electrode, and a large current passed for about twenty minutes, the positive electrode being on the back. The animal was killed, and the knee was then removed by cutting well above and below it, and placed directly into ferrous sulphate solution. On cutting into the knee the next day the patellar tendon was found to be stained deep blue by the action of the ferrous sulphate on the ferricyanide ions, and the blue staining actually went into the cartilage of parts of the joint to a considerable depth. The control experiment, where a similar pad was left on without passing any current, gave an absolutely negative result, no ferricyanide penetrating the skin.

With regard to ionization the *contraindications* are as follows: (1) Cuts and abrasions. Ionization must never be attempted over an area containing a skin abrasion without first sealing the spot with a non-conducting substance. A very good way is to dry the skin thoroughly and then apply a small piece of rubber sticking-plaster. (2) Eczema, psoriasis, and other skin lesions over the area it is desired to treat contraindicate, as they consist of multiple small spots over which the epithelium is thinned. (3) In some patients ionization produces an outbreak of small papules, which will prevent further treatment. (4) Skin burns produced by careless treatment. The best treatment of such a burn is to leave it alone and let it dry up. (*See also page* 72.)

Chronic rheumatism is certainly benefited, in some way not yet understood, by the taking of **Radium Water** daily by the mouth. The dose, broadly speaking, is from half to one litre in three doses, the radium emanations in the water being between 1,000 and 10,000 mache units. It is not always easy to get a constant supply of radium emanation water, however, and it would seem that benefit is equally

obtainable from the daily inhalation of radium-oxygen produced by an apparatus invented by Prof. Paul Lazarus and Dr. Saubermann, and described by William Armstrong[7] (*Fig.* 97).

A perforated steel tube is inserted into the axis of a steel cylinder, and filled with radium substance; the cylinder is filled with oxygen, 200 to 250 mache units radium emanation to each litre of oxygen. Dose: $\frac{1}{4}$ to $\frac{1}{2}$ litre per minute. An inspiration tube leads from the cylinder to the breathing mask, and from the mask another tube conducts the expired air to a regenerating chamber designed on the principle of the oxygen life-saving apparatus; the CO_2 and H_2O vapour are removed and the purified air is drawn back into the inspiration tube by means of an injector. None of the radium emanation is lost; the air becomes more and more highly charged with radium emanation. Miracles are not claimed for this method of treatment; but it is affirmed by Dr. Armstrong that it possesses marked advantages over any other that he has used.

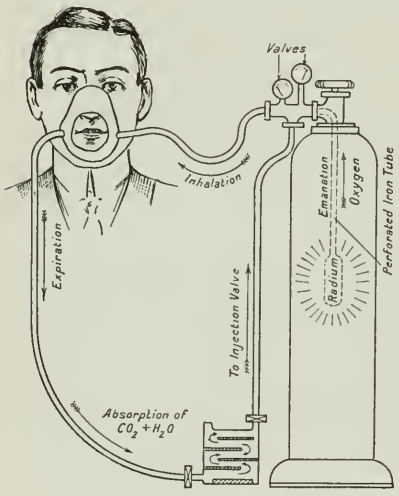


Fig. 97.—Apparatus for inhalation of radium emanation and oxygen in closed circuit.

The **X-rays,** applied locally, as an additional means of alleviating the pain and swelling in joints affected by rheumatoid arthritis, are advocated by Chisholm Williams.[8] An average application would be for ten minutes, but the author does not give details as to the distance of the joint from the tube, etc. Apparently a large number of applications are required, but swelling of the affected joint decreases after a few sittings, and pain is undoubtedly lessened. It is noteworthy that skiagrams taken before and after the course of treatment show little if any alteration in the bony outlines, although clinically the decrease in swelling may be remarkable. It seems clear that the changes produced by the rays are in the ligaments and soft parts rather than in the bones.

The treatment of rheumatism, sciatica, and some chronic forms of arthritis at **Foreign Spas,** has been discussed at some length by R. Fortescue Fox.[9] Lionel Calthrop,[10] however, lays stress upon the fact that most of the **English Spas** now pay equal attention to the treatment of rheumatoid arthritis, with equal benefit in suitable cases.

W. J. Midelton[11] recommends the administration of small doses of **Thyroid Extract** in joint cases of this kind, suggesting 1½ gr. once a day, in addition to whatever other treatment is thought good at the

same time. He gives a few illustrative cases. One is not convinced of the causal relationship between thyroid inadequacy and rheumatoid arthritis, but the treatment seems worth trying if its effects are very carefully watched. Midelton lays stress on two additional points of importance, namely: (1) That thinness or even emaciation of a patient is no proof that treatment by thyroid extract is not called for; (2) That if the remedy is indicated at all it is generally needed for the rest of the patient's life. Too little stress is laid upon these two points as a rule. The use of **Combined Glandular Extracts** is alluded to at *page* 30. A **Calcium-free Diet** is recommended at p. 7.)

REFERENCES.—[1]*Ann. Surg.* 1912, i, 750; [2]*Pract.* 1912, i, 107; [3]*Ibid.* 22; [4]*Lancet*, 1912, i, 1053; [5]*Ibid.* 1059; [6]*Pract.* 1912, i, 134; [7]*Ibid.* 156; [8]*Ibid*, 141; [9]*Ibid.* 170; [10]*Ibid.* 161; [11]*Ibid.* 180.

RHINITIS, FIBRINOUS. *Frederick Langmead, M.D., M.R.C.P.*

A. M. Gossage[1] states that the condition is not very uncommon in children, especially in early childhood. A nasal discharge is present, associated with a fibrinous or membranous exudation on the nasal mucosa, which persists for six or eight weeks and then clears up. Bacilli, indistinguishable from the Klebs-Löffler bacillus, can nearly always be found, but although infectious, it does not seem to be true diphtheria, and is unaccompanied by serious illness. Another type has been described by Baumgarten, the special features of which are tube formation in the nostrils in early infancy, followed by the development of ozæna about the fifth year of life.

Gossage has encountered a family, several members of which had a persistent fibrinous discharge from the nose, first noticed at birth and apparently persisting throughout life. It caused no impairment of health. Specimens of the discharge, which usually took about twelve hours to form, were obtained, and in all the cases examined were found to be more or less complete fibrinous casts of the nostrils. Film preparations showed polymorphonuclear cells embedded in a fibrinous network. No *B. diphtheriæ* or *B. xerosis* were seen. He was unable to find in the literature any record of a similar congenital abnormality.

REFERENCE.—[1]*Lancet*, 1912, i, 723.

RICKETS. *Frederick Langmead, M.D., M.R.C.P.*

ETIOLOGY.—Eric Pritchard[1] considers that there is at first indigestion, due generally to faulty feeding. Toxic products follow, which the liver attempts to oxidize or destroy, but failing in its purpose, the toxins escape into the circulation and poison the nervous system. This in turn leads to further hepatic inefficiency, and also to incapacity of the other great furnaces of the body, so that even the normal food products cannot be dealt with adequately. An acidosis follows, and for the neutralization of these acid products, the tissues are deprived of calcium, ammonium, and other elements. The liver may be inherently inefficient, or may be primarily damaged by the faulty method of feeding.

R. Vaglio,[2] from a study of the osseous changes, thinks that some of the characteristic appearances met with in rachitic bones are inflammatory in their nature, and owe their origin to various infections or toxins; others, however, are quite distinct from these lesions and are to be ascribed to a want of compensation for the usual deficiency of internal secretions, especially of the thyroid, a deficiency which normally exists for the first few years of life. On the contrary, Stocker[3] suggests, on experimental and clinical grounds, that the cause of rickets may be an over-functioning of the ovaries and testicles.

Ashby[4] discusses the origin of the *anæmia* of rickets. Like Pritchard, he holds that unsuitable methods of feeding act by causing intestinal disturbance, and that the resulting toxins produce both the rickets and the anæmia, which therefore cannot be said to be a sign of rickets but related to it, both having a common source. The degree of the anæmia seems often to correspond to the severity and duration of the gastro-intestinal disturbance. Contrary to most authorities, he contends that the splenic anæmia of infants is not a disease *sui generis*, but merely an intense secondary anæmia. All gradations of severity, from a slight anæmia to splenic anæmia, may be encountered in rickety children, and it is impossible to draw a hard and fast line between the two conditions. He agrees, however, that in cases where the most marked bony changes exist there may be little anæmia, and vice versa.

Treatment.—Marfan[5] considers **Cod-Liver Oil** and preparations of **Phosphorus** and **Calcium** the chief therapeutic measures in rickets. He advises the use of the yellow oil of phosphorus, given in doses of two teaspoonfuls daily, and gradually increased up to two tablespoonfuls. **Calcium Phosphate** preparations are insoluble, but may be taken as a powder in the food. He prefers **Calcium Hypophosphite** (gr. 1½–3 per diem) to either the syrup of lactophosphate or chloro-hydrophosphate, and especially recommends **Glycerophosphate of Lime** in doses of gr. ½–3, according to age. Larger doses seem to produce nervous excitement. He quotes Kassowitz as a great believer in **Oil of Phosphorus,** given as follows: phosphorus 1 cgm, cod-liver oil 100 gms—one to three teaspoonfuls daily; but considers oil of bitter almonds a better vehicle than cod-liver oil. Others recommend organic compounds of phosphorus, as **Lecithin, Nucleinate of Soda,** and **Phytine.** After many trials he finds the following combination the most beneficial: syrup of lemon 5 oz. (approx.), liquid glycerophosphate of lime and formate of lime ½ dr. (equal parts)—one to four teaspoonfuls per diem.

Organotherapy has also been tried with varying results. The following have been recommended: bone marrow, extract of periosteum, and of bone (results not detailed); thyroid, which was beneficial only when signs of hypothyroidism were present; thymus, which proved valueless; **Adrenalin.** Marfan recommends an extended trial of the latter in a one per thousand solution, one to six drops daily, by the mouth. Parathyroid gland gave no result. He finds **Galvanization** of the spine by an alternating current, electric baths, and electric-light baths, followed by a cold douche, useful.

The treatment of the *deformities* depends on the stage of the rickets. Before the bone has consolidated, he recommends padded splints. General and respiratory **Gymnastics** should be employed to correct the thoracic deformity, and lateral suspension over the mother's knee and appropriate corsets for the scoliosis. After the fourth year the deformities, except those of the chest, are usually final, and gymnastics, orthopædics, and surgical intervention, play a greater part.

(*Vol.* 1912, *p.* 33)—**Phytin** is recommended as serving to increase appetite.

REFERENCES.—[1]*Clin. Jour.* 1911, 364; [2]*La Pediat.* 1910, 629 (*Brit. Jour. of Child. Dis.* viii, 90); [3]*Zentralb. f. Gyn.* 1911, Jan. 21 (*Brit. Jour. of Child. Dis.* viii, 329); [4]*Pract.* 1912, i, 675; [5]*Paris Méd.* 1911, i, 383 (*Brit. Jour. Child. Dis.* 1911, 564).

RINGWORM OF SCALP. *E. Graham Little, M.D., F.R.C.P.*

TREATMENT.—Riddell[1] deprecates the *x*-ray treatment of ringworm of the scalp as a routine measure, and advocates **Ionization,** which he performs as follows: The child's head is shaved, and a solution of the drug to be used is rubbed well into the affected parts. Folds of lint (10 to 16 ply) well soaked in the same solution are applied evenly to the surface so as to overlap the diseased area; over this the positive electrode is placed and secured by a few turns of bandage. The negative electrode should also be secured in position. The most convenient electrode (positive) is copper gauze, which can be bent to fit the part. A 1 per cent solution of **Mercuric Chloride** or 1 per cent watery solution of **Iodine** should be used. The sitting should be of forty to fifty minutes; when the area treated is large, fifteen to twenty milliampères of current may be used, to be added gradually. This may be repeated three times a week, the head to be washed in the intervals with an antiseptic, or with green soap mixture. About thirteen sittings on an average produce a cure. The method is recommended as being safer, while possibly rather more tedious, than the *x*-ray exposure, in which, however, baldness results in about 2 per cent of the cases.

(*Vol.* 1912, *p.* 25)—**Mercury Colloid** has been found a useful local application. At p. 74 of the same volume an account is given of precautions to be observed in using **X-Rays** for the treatment of this disease.

REFERENCE.—[1]*Glasg. Med. Jour.* 1912, i, 118.

RODENT ULCER. *E. Graham Little, M.D., F.R.C.P.*

Morton,[1] after treating twenty-seven cases of rodent ulcer with **Solid Carbon Dioxide,** gives it as his opinion that this method is to be preferred to radium, *x*-rays, or ionization. Recurrences are fewer, the destruction is more rapid and certain, and the procedure is safer than with the other means named. Severe and extensive cases are better dealt with by surgical interference. **Ionization** is also recommended (*pages* 70, 73).

REFERENCE.—[1]*Lancet*, 1912, i, 1333.

SCARLET FEVER. *E. W. Goodall, M.D.*

Not a few scarlet-fever patients develop a *discharge from the nose* during the convalescent stage. At the present time most authorities hold that this contains the virus of the disease, and that patients thus affected are particularly prone to carry infection after they leave the isolation hospital. Hence it is considered very important that the patient should be free from rhinorrhœa when he leaves, and every endeavour is made to cure it. Unfortunately it is very resistant to treatment, and, quite apart from the question of infection, is the cause of the lengthy detention of patients in hospital on account of the inflammatory condition of the anterior nares and upper lip to which it gives rise.

Treatment.—The usual treatment is syringing the nasal passages with an antiseptic and astringent solution, the application of ointment to the inflamed and eczematous nostrils and lip, and the placing of the patient's elbows in cardboard splints to prevent him from aggravating the morbid state of the nostrils by picking them. Kolmer and Weston[1] have reported cases treated with **Bacterial Vaccines.** In these cases the most constant organism found in the nasal discharges was a staphylococcus, especially the *Staphylococcus aureus*; in a few cases there were also found *Staphylococcus albus*, a diphtheria-like bacillus, and *Streptococcus pyogenes*. Their procedure as regards treatment was as follows: "Cases of nasal discharge were reported on the second or third day of discharge. The case was then examined, and the question of the advisability of bacterin [vaccine] treatment considered. A culture was made, and in a large number a dose of stock polyvalent *Staphylococcus aureus* vaccine was administered at once. In many cases this was the only dose required, but all were cultured in order to detect the presence of some organism other than the *Staphylococcus aureus*. If two organisms were found, they were isolated, and a separate bacterin of each was prepared. The aggregate dose of the two bacterins equalled the usual dose of one. The size of a dose depended upon the general condition of the patient, the younger and weaker receiving correspondingly smaller doses. The initial dose varied from 50 to 100 million of staphylococci, and 50 to 80 million of the diphtheria-like organism. Succeeding doses were given every four to eight days, depending upon the clinical aspect of the patient. All other treatment was stopped, except cleanliness of the parts and application of soothing ointments. Other infections, toxæmia with fever, nephritis, and low vitality, were considered contra-indications."

A slight local inflammation and a febrile attack usually followed the injection of the vaccine. In the majority of cases the nasal discharge began to diminish after twenty-four hours. If no improvement followed three doses, another culture was made and a fresh vaccine prepared. If adenoids were found, vaccine treatment was stopped, as, after thorough trial in a few such cases, it was shown to be quite useless. Of 100 cases treated with vaccines, 77 were cured, 8 improved,

12 did not improve, and in 3 the supervention of another infectious disease led to the abandonment of the treatment. In 9 of the unimproved cases, adenoids were present.

About half the cases were treated with autogenous, and the other half with stock vaccines, and the results were about equal. The authors were not able to trace one " return case " which could be attributed directly or remotely to one of the cases which received vaccine treatment. They came to the conclusion that this treatment was more satisfactory than the usual treatment.

Prophylaxis.—Following Gabritschewsky,[2] Watters[3] has carried out prophylactic inoculation against scarlet fever with **Streptococcus Vaccine.** Cultures were made from the throats of a number of scarlet-fever patients, and many strains of streptococci isolated. These were combined to make a polyvalent vaccine, standardized at 500 million per c.c. Those " vaccinated " were nurses who were shortly to undertake the nursing of cases of scarlet fever, and who had never suffered from that disease. About two or three weeks before a given nurse was going to the scarlet-fever wards, she was given 50 million of the polyvalent streptococcus vaccine. There was usually some local reaction at the seat of inoculation (the arm), with headache and malaise. A week later a dose of 100 million cocci was given, and another week later a third dose of 200 million.

During the two years 1910 and 1911 there were 35 nurses who had not had scarlet fever ; of these 21 received the vaccine and 14 did not. Of the former, 1 caught scarlet fever ; of the latter, 5. Besides these cases there was one nurse who received a single dose of vaccine the day she went on duty, and who contracted scarlet fever in twenty-four hours.

References.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 403 ; [2]*Centralbl. f. Bakteriol.* 1906, xli, 719 ; [3]*Jour. Amer. Med. Assoc.* 1912, i, 546.

SCARS.

(*Vol.* 1912, *pp.* 480, 486)—Depressed and disfiguring scars may be treated by subcutaneous injection of **Paraffin** ; careful asepsis is essential, and it is better to inject too little rather than too much. **Passive Hyperæmia** systematicly applied is also said to lead to the disappearance of scars.

SCIATICA. *Purves Stewart, M.D., F.R.C.P.*

Treatment.—The use of **Perineural Injections** of large quantities (50 to 100 c.c.) of **Normal Saline** solution, containing 0·1 per cent of **β-Eucaine,** originally introduced in 1907 by Lange, of Leipsic, has already been described by the writer in the Medical Annual, 1910 (p. 545). Further experience of this method confirms the favourable opinion then expressed.

The *technique* of the operation may be briefly recalled. With the patient lying on his face and a pillow placed beneath the pelvis, the point of exit of the sciatic nerve through the sciatic foramen is located as follows : A line is drawn from the sacrococcygeal joint to the postero-external border of the great trochanter. This line is divided

into thirds. The spine of the ischium is at the junction of the outer two-thirds with the inner third, and the sciatic nerve emerges one inch external to this point. Having sterilized the skin, and frozen it with a chloride of ethyl spray, the hollow needle is pushed perpendicularly inwards, penetrating the gluteal muscle until at a depth of about 6 to 12 cm. (varying with the thickness of fat and muscle) the nerve-trunk is reached, and the patient feels a momentary twinge of pain radiating down to the popliteal space and outer side of the heel. The sterilized saline solution is then injected by means of a syringe, and the needle puncture is finally sealed with collodion. After a successful injection there may be a sensation of fullness and heaviness in the limb, but there is neither anæsthesia nor motor paralysis. The sciatic pain sometimes clears up completely within twenty-four hours after a single injection. In other cases it may be necessary to repeat the injection once or twice at intervals of a couple of days.

Leszynsky[1] reports a series of 25 cases, of which 13 were cured (after one to four injections), 10 were improved, and 2 were unimproved (after a single injection). Of these two, one was a patient with tuberculosis of the hip, associated with sciatic pain, and therefore unsuitable for this treatment.

Counter-irritation is recommended on *page* 11. **Ionization** (*page* 74) and **Incandescent Light** (*page* 77) are also said to be useful.

Diagnosis.—The possibility of sciatic pain being referred from affections of the hip joint or sacro-iliac joint, or from pressure upon the sacral plexus within the pelvis by tumours, parturition, injuries, etc., has always to be borne in mind, and such causes have to be excluded before regarding any case as one of primary sciatic neuritis or neuralgia. A few months ago the writer saw an instructive case of this sort in a man who had agonizing sciatic pain, accompanied by loss of the corresponding ankle-jerk, after a trivial blow to the pelvis following a jar by his bicycle saddle when dismounting. No evidence of joint trouble could be detected on careful examination of the hip, sacro-iliac, or vertebral regions. Large saline injections around the nerve-trunk failed to relieve him. A radiogram of the pelvis showed a sharp exostosis on the front of the sacro-iliac joint, exactly where the lumbo-sacral cord crosses the pelvic brim. The failure of the injections into the nerve outside the pelvis was thus readily explained.

Rogers,[2] of Boston, scouts the idea of neuritis or perineuritis as causes of sciatic pain, and holds that the most common primary cause is some disturbance of the sacro-iliac joint, whether from trauma, faulty posture of the spine, or other cause. He maintains that Lasègue's sign of sciatic neuritis (in which pain is produced by passively flexing the leg and extending the knee) is due not to stretching of the sciatic trunk, but to strain on the hamstrings pulling on the ischial tuberosity, and thereby stretching the ligaments of the sacro-iliac joint. He records six cases of sciatic pain, most of them following a sudden strain, in which manipulation of the sacro-iliac joint, with or without an anæsthetic, promptly relieved the pain. These cases

are instructive, since in none of them would perineural injections have been of any avail. But a careful observer would not have suggested injections for the treatment of such cases. Rogers, moreover, seems to overstate his case when he denies the existence of primary sciatic neuritis.

References.—[1]*Med. Rec.* 1912, i, 814; [2]*Bost. Med. and Surg. Jour.* 1911, ii, 760.

SCLERODERMIA. *E. Graham Little, M.D., F.R.C.P.*

Treatment.—Kölle[1] reports two cases of sclerodermia, and recommends the following treatment. The **Diet** should be lacto-vegetarian. **Vapour Baths, Air Baths,** and **Gymnastic Exercises,** with **Massage** after the bath, are recommended. In eight weeks with this treatment improvement in the first case was marked, and was maintained three years later. In the second case, which was more severe, the same treatment combined with Schwerdt's mesentery-gland extract (Merck's tablets of **Cœliacin**) produced an excellent result. The dose was at first two tablets daily, containing each gr. ·3 of dried gland substance, increased after six weeks to three tablets.

Reference.—[1]*Münch. med. Woch.* 1912, 864.

SCORPION STINGS. *Leonard Rogers, M.D., F.R.C.P.*

Lloyd H. Mills[1] has studied the effects of scorpion stings in Mexico, where they are a very common and often serious affection, especially in the south of the country, where the most virulent varieties occur, causing many deaths in young children and very feeble adults. Certain human beings have a natural immunity. There is no proof that immunity can be produced by repeated inoculations, but scorpions' blood contains protective substances which render them immune to their own poisons, and which, if injected early and in sufficient quantity, markedly relieve the symptoms in human beings stung by them. The poisons produce a grave serous meningitis.

Treatment.—The best method is simple **Incision** and the local use of **Evaporating Lotions,** combined in severe cases with **Lumbar Puncture,** repeated if necessary, the hypodermic injection of 1 c.c. per kilo weight of **Scorpion's Blood,** and the internal administration of **Stimulants** such as black coffee and aromatic spirits of ammonia.

Reference.—[1]*Bost. Med. & Surg. Jour.* 1912, ii, 183.

SCROTUM, LYMPHATICS OF. *Priestley Leech, M.D., F.R.C.S.*

Morley[1] has investigated the distribution of the lymphatics of the scrotum. In classification of the superficial inguinal glands, two imaginary straight lines are drawn, one vertical and the other horizontal, which meet at the junction of the saphenous with the femoral vein; this separates the glands into four groups, viz., supero-external, supero-internal, infero-external, and infero-internal (*Fig.* 98). The lower part of the imaginary vertical line corresponds roughly to the internal saphenous vein. The lymphatic trunks are divided into

three sets, anterior, posterior, and lateral. The medial trunks of the anterior set run up the anterior surface of the scrotum parallel and close to the raphe, until they reach the root of the penis. Here they mount up on to the lateral aspect of the penis, the highest and most medially placed trunk reaching a point on the side of that organ varying from 1 cm. to 2·5 cm. from its root. Curving down on the dorso-lateral aspect of the penis, they gain its root, pass outwards and slightly upwards into the subcutaneous fat of the abdominal wall about 1 cm. above the pubic spine, run at first parallel to and above Poupart's ligament, and then turning down and crossing it obliquely,

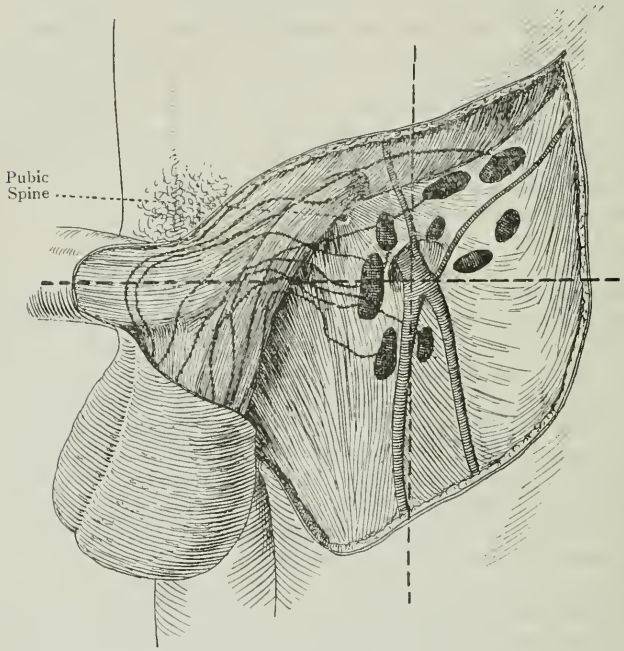


Fig. 98.—Dissection of the Scrotal Lymphatics, showing Morley's method of classification.

end as a rule in a gland of the supero-external group, which lies just below Poupart's ligament with which its long axis is parallel. This gland always lies definitely to the outer side of the saphenous vein and may be within 4 cm. of the anterior superior spine. He has never been able to find a trunk that passed by the inguinal glands and entered the intra-pelvic glands immediately.

The *practical conclusions* are, that in consequence of the very free anastomosis between the superficial lymphatic network of opposite sides, it is obvious that whenever an epithelioma approaches the median raphe the glands of both groins must be removed. In view of the termination of the medial trunks from the anterior surface in the

supero-external glands, when a growth approaches the anterior raphe, the subcutaneous tissue and glands should be removed to within one inch of the anterior superior spine of the ilium. It is essential to remove the superficial inguinal glands and the subcutaneous tissue in which they lie from practically the whole of Scarpa's triangle, and to carry the upper limit of the dissection well above the inner half of Poupart's ligament. To clear the triangle efficiently, the upper three inches (7·5 cm.) of the internal saphenous vein must be excised, and the femoral sheath stripped clean. If all the intervening lymphatic vessels, in addition to primary growth and glands, are to be removed, it will be impossible to bring the skin together, and grafting will have to be resorted to.

REFERENCE.—[1]*Lancet*, 1911, ii, 1545.

SCURVY. *Herbert French, M.D., F.R.C.P.*

W. W. Pitchford[1] publishes an admirable survey of modern views upon scurvy, and brings strong evidence against its being an infective malady, and in favour of its being purely what may be called "a dietetic cachexia." It is remarkable that mere absence of all food or chronic defect in the amount of food, provided the right kinds are present, does not produce scurvy or any analogous complaint, and that the dietetic cachexia requires that a patient should be eating food, not necessarily of the wrong kind, but defective in some necessary ingredient. He brings into line upon a common basis of dietetic error such apparently different maladies as scurvy, rickets, Barlow's disease or scurvy-rickets, ship's beri-beri, possibly pellagra, and a peculiar malady of fowls which occurs in Java, and is known as polyneuritis gallinarum. The latter was discovered by Eijkman (*Virchow's Archives*, cxlviii., 1897), a Dutch physician then resident in Java. He noticed more or less accidentally that chickens develop peripheral neuritis, sicken, and die, if their food consists solely of white rice, pearl barley, sago, or tapioca. He subsequently ascertained that the disease was also developed by a diet of meat or of whole bread which had been previously cooked in an autoclave for two hours at a temperature of 150° C., or over. Whole rice, barley, oats, and rye boiled in the ordinary manner at 100° C. were found not to be capable of producing the disease. The changes in the bodies of the dead birds comprised a degeneration of the peripheral nerves, especially those of the legs, usually subcutaneous œdema, and fatty degeneration of the heart muscle. The similarity between these changes in the fowls and in patients suffering from beri-beri are remarkable, and the fact that the supply of undecorticated rice prevents ship's beri-beri altogether, whilst a diet of decorticated rice produces it, has now been practically established. The dietetic cachexias divide themselves naturally into two groups: (1) Those essentially consequent upon want of animal or fresh vegetable food, and which are characterized by lesions of the bones, hæmorrhages, and sometimes œdema, as instanced by scurvy, rickets, and scurvy-rickets; and (2) Those produced by the want of

some not yet identified principle occurring naturally beneath the pericarp of grain, and which are characterized by œdema and peripheral neuritis, as in ship's beri-beri in man, and the polyneuritis gallinarum of fowls.

This broad view, which brings into one category several different maladies which might at first sight appear to have nothing in common, is distinctly helpful to the clinician.

Scurvy is now undoubtedly very rare in most countries, but it is remarkable how much more frequently it is diagnosed in certain clinics than in others. The reason for this is probably that to some authorities the mere occurrence of exuberantly spongy bleeding gums, together with a tendency to sub-periosteal and intramuscular hæmorrhages and general cachexia, are sufficient to warrant the diagnosis, whereas others decline to label the condition scurvy unless not only have all other possible explanations of the symptoms been excluded, but also the disease can be definitely attributed to dietetic causes, especially the absence of fresh meat and vegetables. Thus, Laache, of Christiania,[2] points out that some cases which a few years ago would have been called scurvy are due to acute leukæmia with excessive pseudo-scorbutic stomatitis. He thinks some of the cases labelled sporadic scurvy ending fatally after a comparatively short course are in reality undiagnosed acute leukæmia ; whilst another disease in which excessive sponginess of the gums may be found is Bright's disease. Amongst the Norwegian fishermen, however, who are occasionally a long time at sea, there occurs a malady known locally as " radesyge," and Laache believes this to be a form of scurvy ; he describes the malady and gives a fairly detailed account of six cases. He also believes that beri-beri, at any rate that type which occurs on shipboard, is a variety of scurvy.

Tuschinsky and Iwaschenzow,[3] unlike Laache, appear to find scurvy a comparatively common disease in the neighbourhood of St. Petersburg, though whether the cases recorded by them are really scurvy, and not some other variety of severe stomatitis, it is difficult to decide from their paper. They say, " During this year relatively few cases of scurvy have been admitted to the hospital, so that from April to August, 1911, we were able to observe only eight cases." If eight cases in five months is below the average with them, the incidence in their district must be much higher than in most parts of Europe. Whether their patients had scurvy or not, however, they were suffering from a severe form of hæmorrhagic stomatitis, and were treated by intravenous injections of **Salvarsan** upon the ground that many such cases, though not syphilitic, are infected by spirochætes allied to, if not identical with, those met with in Vincent's angina. They record eight cases in which doses of salvarsan, varying from 0·2 to 0·5 gram, were given at intervals varying from four days to a fortnight ; and although the degree of the illness was sometimes extreme, the results of the treatment appear to have been eminently satisfactory. That the stomatitis in these cases was not syphilitic is

shown by the fact that the Wassermann reaction was negative. Severe cases of stomatitis with generalized purpura, swollen joints, and hæmorrhage beneath the periosteum and into the muscles, are not common in Great Britain, but they do occur from time to time, and the possibility of their being benefited by salvarsan treatment, although the patients are not suffering from syphilis, seems to be well worth bearing in mind.

(*Vol.* 1912, *p.* 55)—Gerber states that the gum lesions depend upon the presence of a spirochæte and a fusiform bacillus ; and that cure is rapidly effected by injections of **Salvarsan.**

REFERENCES.—[1]*S. Afr. Med. Rec.* 1912, 247 ; [2]*Rev. de Méd.* 1911, 376 ; [3]*Münch. med. Woch.* 1911, 2671.

SEA-SICKNESS.

(*Vol.* 1912, *p.* 483)—**Chloretone,** given in an initial dose of 10 gr. in a capsule, followed by 5-gr. doses thrice daily for two or three days, is strongly recommended. **Validol** has also proved very effective ; it should be taken hourly, starting two or three hours before the voyage begins, and continuing till nausea is abolished. The initial dose is 30 drops, followed by 25 and then by 15 drops, in each case on a lump of sugar.

SEBACEOUS CYSTS.

These may be got rid of by **Electrolysis** (*page* 75).

SEPTICÆMIA.

(*Vol.* 1912, *p.* 65)—Systematic administration of large draughts of **Water** is advocated by McCrae.

SINUSES. *Priestley Leech, M.D., F.R.C.S.*

Opinions as to the advantages of **Bismuth Paste** in the treatment of sinuses vary very much.

Willard[1] thinks no other line of non-operative treatment has given such favourable results in the cure of chronic intractable suppurating sinuses. Its use is contraindicated in acute cases with free discharge, in which the injection may rupture the walls of the cavity and thus spread the infection ; in tuberculous joints before the formation of sinuses ; in sinuses from the cranium ; in biliary and pancreatic fistulæ ; and in cases with advanced amyloid degeneration of the vital organs.

Mitchell[2] has tried a paste of equal parts of **Petrolatum** and **Chalk ;** it is safer than bismuth, as it gives rise to no poisoning ; it separates the walls of the wound or sinus and allows of *x*-ray photographs.

Blanchard[3] deprecates the further use of bismuth paste ; many cases of poisoning have been reported, and its curative action is merely a mechanical one. The ideal paste must be non-toxic and absorbable, and must solidify at the body temperature to crowd out the pus, compress the unhealthy granulations, and exclude the air. The formula he has used is **White Wax** 1 part, **Vaseline** 8 parts ; mix while boiling. **Iodine** may be added in badly infected cases. Immediately after injection, a thick pad of gauze saturated with alcohol is bound over the opening. For *x-raying* the ramifications of the sinus, he injects the following : ferri subcarb., 1 part, white vaseline two parts ; mix and boil. It should not be used where there is a sequestrum,

or in a primary newly opened sinus. He considers this method gives good results.

Sgalitzer[4] has a long article on this question. For the diagnosis of the ramifications of fistulæ and sinuses, bismuth injection is exceedingly useful and often demonstrates the existence of foci of disease which the surgeon had not suspected. He has had good results, and considers the method a useful one ; he advises against injections into fistulæ and sinuses which lead into a cavity. Bismuth poisoning will not be encountered if this be avoided, and if not more than 30 cm. of a 33 per cent paste be used. Embolism and thrombosis may be avoided by injecting at not too high a pressure, and by keeping clear of the great vessels in injections into the axilla or groin.

Erdheim,[5] on the contrary, has met with cases of poisoning. He thinks that the cases should be carefully chosen ; the method is not suitable for universal use, but should be confined to hospitals.

Brandes[6] writes of the end-results of bismuth-paste injection. He has used carbonate of bismuth, and has found no difference in therapeutic efficacy between this and the subnitrate. He has tried iodipin and other substances, but they are inferior both for *x*-ray diagnosis and for treatment.

See also **Allantoin** (*page* 4), **Scarlet Red** (*page* 5), *and* **Zinc Ionization** (*page* 72.)

References.—[1]*Therap. Gaz.* 1911, 761 ; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 394 ; [3]*Med. Rec.* 1912, i, 941 ; [4]*Wien. klin. Woch.* 1912, 740 ; [5]*Ibid.* 1912, 749 ; [6]*Münch. med. Woch.* 1912, 1598.

SKIN DISEASES, GENERAL THERAPEUTICS OF.

E. Graham Little, M.D., F.R.C.P.

Formaldehyde in the Removal of Warts and Nævi.—Hammond[1] recommends the following method in treating *warts, clavus, callosities, pigmentary nævi,* and *cornu cutaneum.* Formaldehyde (40 per cent) is applied with a wooden stick every three or six hours for two or three days. It must be carefully restricted to the diseased tissue, as it may produce dermatitis on the unaffected skin. The process is nearly painless, as local anæsthesia of a certain degree results from the application.

Freezing by CO_2 Snow.—Sibley[2] recommends a modification which has certain advantages. The solid snow is immersed in ether in sufficient quantity to produce a gelatinous mass. This can be painted with a brush on the parts to be treated ; or swabs soaked in it may be pressed on the skin as in using liquid air. The method is most applicable to patches of *lupus vulgaris,* especially in cavities like the nose and mouth. The mixture should be painted continuously on the part for about a minute. Blisters and superficial ulceration follow, as in using carbon dioxide snow directly.

Vaccines.—Agnes Savill[3] reports some further success with vaccine treatment in *seborrhœa of the scalp.* The diagnosis rests on the finding of the microbacillus in abundance in the hair follicle. From 20 to

300 million bacilli were used at each injection ; and eleven to sixteen injections were required. Greasiness diminishes almost immediately, and subsequently hair-fall is arrested. Local treatment was not used during the vaccine injections.

Galbraith[1] gives the following conclusions as a result of his experience with *acne*. Acne bacillus is the cause ; staphylococcus is a mere surface contamination. Doses should be from 30 to 100 million or more. Treatment must be prolonged—from three to five months in milder cases, six to twelve months in severe cases ; pustulation offers a clinical means of regulating the dose and frequency. The great majority of cases yield to treatment. Autogenous vaccines give no better results than stock vaccines.

The same author found acne vaccine the most useful treatment in *seborrhœic alopecia*. Doses are somewhat larger than in acne—rising to 400 million or more. No negative-phase reactions occurred at any time. Galbraith regards the pustulation of *rosacea* as due to acne bacillus rather than staphylococcus, and finds the vaccine similarly useful in that condition.

Galbraith also found *S. aureus* in four-fifths of his cases of *sycosis* ; the remainder were due to *S. albus*. **Autogenous Staphylococcal Vaccines** in doses of 100 to 1000 millions are recommended, the average number of injections required being fifteen. In the very chronic cases vaccines are not so useful, and **Bier's Cupping Methods** are better. In *boils* and *carbuncles* vaccines are by far the best means of cure, an autogenous vaccine being here also recommended, in doses of 150 to 750 millions.

Diet In.—Montgomery and Culver[5] point out that cows' milk is rich in fat, and that fat becomes stored unchanged in the sebaceous glands and in the skin, so that an excess of fat circulating in the blood is deposited in the skin, and becomes broken up by the bacteria, which are rendered more virulent by its presence. Milk fat is especially liable to bacterial change. In infants subject to eczema, Combe found that a diet of milk free from fat (buttermilk) caused improvement. Milk fat (cream and butter) should be withheld from the diet of patients suffering from acne, seborrhœic eczema, furuncle, carbuncle, and erysipelas.

See **Counter-irritation** (*page* 11), **Urotropin** (*page* 16), **Ionization** (*page* 73), *and* **Incandescent Light** (*page* 77).

REFERENCES.—[1]*Amer. Med.* 1912, 391 ; [2]*Pract.* 1912, ii, 134 ; [3]*Ibid.* 338 ; [4]*Ibid.* 370 ; [5]*Jour. Cut. Dis.* 1912, 319.

SKIN GRAFTING. (*See* GRAFTING.)

SMALL-POX. *E. W. Goodall, M.D.*

TREATMENT.—In their book, "Acute Contagious Diseases," Welch and Schamberg advocated the local use of **Tinct. Iodi.** for the eruption of small-pox, to hasten the stage of desiccation and prevent pitting. Recently Rockhill[1] has employed it in 85 cases of small-pox, and he has confirmed the opinion of these writers. He used a 10 per cent

solution of **Iodine in Glycerin,** painted over the pustules two or three times a day. The pustules on the face, palms, and soles should be opened with a sterile instrument and touched with tincture of iodine.

Reference.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 273.

SPINAL CARIES. (*See also* Tuberculosis, Surgical.)

Herbert French, M.D., F.R.C.P.

B. Sachs[1] draws attention to the important point, in connection with spinal caries and other affections of the vertebral column, that in certain cases the first evidence of the spinal nerves or cord becoming compressed may be dissociative anæsthesia in the legs without paralysis; the patient retains cutaneous sensibility in his lower limbs, but becomes insensible to painful and thermal stimuli as distinct from those of touch. Syringomyelia may be simulated closely for a time. *X*-ray examination of the vertebræ should be resorted to in such cases, even though there may be no direct evidence of spinal caries or other similar lesion at the time. He gives several illustrative cases. He also discusses the question of **Laminectomy** in these and other patients suffering from spinal caries. He is of the opinion that tuberculous pachymeningitis may occur without caries of the vertebræ. He urges that in cases of intense bone disease with little compression, the paralysis, incontinence, and deformity of the spine may be early symptoms; but the cases which begin with dissociation of sensation, with marked girdle pains, or with radiating pains, with paresis rather than paralysis, with little or no vesical disturbance, are those in which the lesion is often extra-spinal, possibly a chronic pachymeningitis, tuberculous or otherwise, with adhesions and exudate; and such cases are, he believes, the proper subjects for operative treatment at a very early stage of the disease.

Reference.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 815.

SPINAL CORD, SURGERY OF. (*See also* Spinal Caries.)

E. W. Hey Groves, M.S., F.R.C.S.

Tumours.—In contrast to the conditions relating to tumours of the brain, those obtaining in the spinal cord are more difficult of diagnosis but much more amenable to treatment. In fact, it needs to be greatly emphasized that **Exploratory Laminectomy** ought to be done much more frequently than it is; (1) Because this often reveals operable tumours; and (2) Because a mere laminectomy frequently relieves such conditions as serous meningitis.

Clarke[1] relates an interesting case of an extramedullary tumour of the eighth cervical and first dorsal segments in a woman of fifty-five. It caused pain, paræsthesia, paralysis, and wasting of the arms, followed by spastic palsy of the legs and paralysis of the bladder. The growth was removed by Hey Groves through a hemi-laminectomy on the left side, from the fifth cervical to the first dorsal vertebræ inclusive. It was a fibroma $1\frac{1}{8}$ in. by $\frac{3}{4}$ in. attached to the pia mater.

Recovery was slow but very satisfactory, and eighteen months later the patient could walk well and had good use of her hands. The extramedullary site of a tumour is indicated by pain, paræsthesia, paralysis, and wasting of muscles, occurring in this order at the segment corresponding to the lesion, and followed by spastic paralysis of the parts below the lesion at a later date.

Elsberg has contributed most valuable information as to the possibility of removal of *intramedullary tumours*. In a paper by himself and Beer[2] some of these cases are detailed. In exposing a tumour which expanded the cord, the substance of the latter was accidentally nicked, and it was noted that soft tumour masses began immediately to extrude from the otherwise intact cord. This gave a clue to the new method, which consists in first exposing the cord and making an incision over the site of the tumour, and then allowing an interval of a week or more to elapse, when, on re-opening the wound, the tumour is found to have extruded on to the surface of the cord, whence it may readily be removed. The following case illustrates well the possibilities of this method. A man, aged forty-two, had had pain and numbness of the neck, shoulders, and arms for two years; later there followed paresis of the left arm, left leg, right arm and right leg, with altered sensation over the whole of the legs, trunk, and post-axial sides of the arms. A laminectomy was performed of the fourth cervical to first dorsal vertebræ inclusive, and an incision 1 cm. long made into the cord where it was most tense. A week later a gliosarcoma, 5 by 2 cm., had extruded and was removed. Within two months there was great recovery of both movement and sensation, which was nearly complete after eight months.

Four similar cases of internal tumours of the lower end of the cord are related by Elsberg[3] in another paper, and a general summary is given of forty-three cases in which laminectomy was performed, thirteen being for tumour of the cord. Most valuable are the observations made upon the stages of improvement which these patients undergo after operation. Root pains are usually relieved very rapidly; the most severe may disappear at once after the operation. In general, the sensory symptoms are the first to improve and the last to be entirely well; a disturbance of the deep muscle sense may persist for years after the operation. In many cases the improvement begins only after a number of days or weeks. In spite of the most delicate operative manipulations, all the symptoms may at first become aggravated. In patients with advanced spinal symptoms of long duration, the beginning of the improvement may be delayed for many weeks, or even for months. Absence of the knee- and ankle-jerks may persist for years after most of the other sensory and motor symptoms have disappeared. It is obvious that where actual destruction of pyramidal fibres has taken place, exaggeration of knee-jerks, ankle clonus, etc., may persist for many years, or be permanent. After an operation for spinal tumour in which there has been no injury to the cord or nerve roots, the improvement will occur in the following order:

sensory (temperature, pain), then motor, then sensory (touch), last of all, deep muscle sense and sense of position.

In the technique of spinal-cord operations, the greatest stress is laid upon careful hæmostasis and exact closure of the dura.

A strong argument for the more frequent employment of exploratory laminectomy is supplied by Bailey and Elsberg.[4] They relate no fewer than seven cases in which severe spinal symptoms were greatly relieved or apparently cured by merely opening the dura after removal of the laminæ. These cases fall into three classes: (1) Those in which no gross disease could be found, but in which all the symptoms disappeared after the operation; (2) Similar cases, with temporary alleviation of the symptoms; and (3) Cases of inoperable tumour of the cord in which the symptoms of pain and pressure were relieved whilst life lasted. It is concluded that "the free removal of spinous processes and laminæ, with the opening of the dura, may have a profound effect on the spinal cord in certain pathological conditions. There are a number of intradural conditions which present symptoms as yet indistinguishable from those of spinal tumour. Even in the absence of increased intradural pressure or a discoverable lesion, the operation of laminectomy and incision of the dura may be of great benefit. For the reasons above stated, and on account of its relative safety in experienced hands, exploratory operations should be done more often."

Posterior Nerve Root Resection and the alternative operations for the relief of pain, spasticity, and visceral crises, are subjects which continue to occupy a great deal of attention. Little,[5] whose father was the first to describe accurately those conditions of infantile spastic paralysis which now bear his name, gives a detailed discussion of the older methods suitable for its treatment. These include tenotomy, tenectomy, and tendon transplantation, followed by long retention in plaster, and careful education of the spastic limbs. Although he speaks favourably of root resection, he contends that much can be done by these older methods, if conducted with patience and perseverance.

In two valuable papers by Foerster[6] and Guleke[7] are given *résumés* of the results of the operation, the wider application of which was first pointed out by the former. Upwards of thirty-eight cases of nerve-root resection for the *relief of pain* have been recorded. In two-thirds of these the pain has not been relieved. Some of these failures are due to the fact that not enough of the roots were cut; others to the existence of a progressive disease, e.g., malignant growth of the spine; and the remainder to the fact that the lesion implicated the grey matter of the cord or the psychic centres. If the operation is to be done for intractable pain in the arm, the third cervical to the second dorsal roots should be divided, and in the leg from the tenth dorsal to the fifth sacral.

In forty-four cases the operation has been done for *severe gastric crises of tabes*. Five died of the operation. Of the thirty-nine survivals, thirty-six were successful, and in three there was alleviation. In

about twenty of the successful cases there has not been sufficient time since the operation to say whether the relief is permanent. In twelve cases there has been partial return of the attacks of vomiting, but in all of these the condition has so far improved that the patients have been able to return to work. In three very severe cases in which incessant vomiting had brought matters to a critical degree of emaciation, the cure lasted for two years, five months (when death occurred from phthisis), and three months.

In fifty-nine cases of *Little's disease* there have been eight deaths and forty-six successful cases. All whose mental condition was good, and in whom careful after-treatment has been carried out for a year, have done excellently.

For the relief of gastric crises, Foerster's original proposal was to resect the seventh to the tenth dorsal roots. He now considers that this is not sufficient, but that all the dorsal roots from the fifth to the twelfth on both sides should be divided. There is no doubt that many of the recurrences or partial failures would be avoided by this method. Another important question is the distinction between gastric crises due to sympathetic irritation, and those due to vagus stimulation. The former are marked by exaltation of the cutaneous sensibility of the thorax and abdomen, with severe colicky pain accompanying the vomiting. The vagus cases, on the other hand, present also symptoms due to irritation of the larynx, bronchi, and heart, whilst the vomiting is of a more cerebral type, i.e., accompanied by nausea rather than abdominal pain. A useful and practical proposal for the determination of which cases will be benefited by root resection, is to give a preliminary epidural or intradural injection of stovaine, which will, by temporarily putting the posterior roots out of action, give evidence of what may be expected from their section. Exner has definitely proposed to attack the malady of gastric crises by a double vagotomy at the gastric ends of the nerves. Of six cases treated by this method, one died, three were improved, one remained unaffected, and one was made worse.

In four cases of posterior root section in tabes, some degree of paraplegia has followed, and in one it appears to be permanent. Guleke urges that his method of extradural root section is to be preferred, as giving less danger of such undesirable cord sequelæ.

Clark and Taylor[8] relate three recent original cases, together with a general review of the subject. In the first, a boy of eighteen who had spastic hemiplegia, the posterior roots from the sixth cervical to the third dorsal were divided, with excellent results. The second, also a boy of eighteen, had spastic hemiplegia with epileptiform attacks. Section of the fourth to the seventh cervical roots cured the arm spasm, and this was maintained until the time of the report, two and a half years later, but the epilepsy continued. In both these cases there was a pemphigus-like eruption on the arm shortly after the operation. In the third case, a boy of five, who had spasm and athetosis of both arms, the fifth, sixth, and eighth cervical roots were divided on one

side, the fifth, seventh and eighth on the other ; this cured the spasm, while the athetosis remained.

Winslow and Spear[9] report one excellent success, in a woman aged fifty, of the root resection operation for gastric crises of four years' duration. They also relate the case of a boy of seventeen, who for nine years had severe athetoid movements of all the limbs. After section of some of the lumbo-sacral roots on the left side, the athetosis of the left leg was cured, whereas the other limbs remained in the same condition as before. This result is remarkable, since Foerster has repeatedly stated that athetosis, being the result of abnormal cerebral irritation, could not be affected by the section of afferent roots.

Jones[10] relates a typical case of root resection for pain. A man aged fifty had for sixteen years suffered from painful twitching of the right arm. Section of the fifth to the seventh cervical roots was followed by no relief. Eighteen months later the fourth and eighth nerves were divided, and he then obtained marked relief, but his condition remained far from satisfactory.

Some very interesting work has been done on the **Section of Sensory Tracts within the Cord** itself, for the relief of pain. Cadwalader and Sweet,[11] experimenting on dogs, divided the antero-lateral columns of white matter, and found this to be followed by weakness of the legs and ataxia, both of which were transitory, together with almost complete and permanent analgesia of the parts below the lesion. Spiller and Martin[12] have used the same operation on a man who had intense pain and paraplegia due to a malignant tumour of the lower end of the spinal cord. Both antero-lateral columns were cut at the level of the seventh dorsal vertebra, between the anterior root and the attachment of the ligamentum denticulatum. This was followed by permanent relief of the pain.

Heile[13] relates a case of a man of thirty-two with gastric crises of a year's duration. The seventh to the ninth roots were divided, but the operation was followed by symptoms of a total transverse lesion of the cord, which led to the dura being re-opened with the expectation of finding a blood-clot. However, the parts appeared normal, but the symptoms persisted, and the man died of cystitis after some months, and it was found that the cord at the site of operation had undergone complete softening and disintegration. Bramwell and Thomson[14] had a remarkably successful case of a man of thirty-three who had had gastric crises for nine years, and who after Foerster's operation remained well for fourteen months.

Technique.—As regards the technique of posterior root resection, attempts have been made in three directions to minimize the length and danger of the operation. Guleke, as already noted, divides the nerves outside the dura. This may be suitable for the cervical and dorsal regions, but in the lumbar and sacral regions the roots pierce the dura so far from their origin, that it would involve a greater difficulty than that which it seeks to overcome. The author of this article[14] and Wilms and Kolb[15] have recommended a procedure, by

PLATE XXXIV.

POSTERIOR NERVE ROOT SECTIONS

(After Hey Groves)

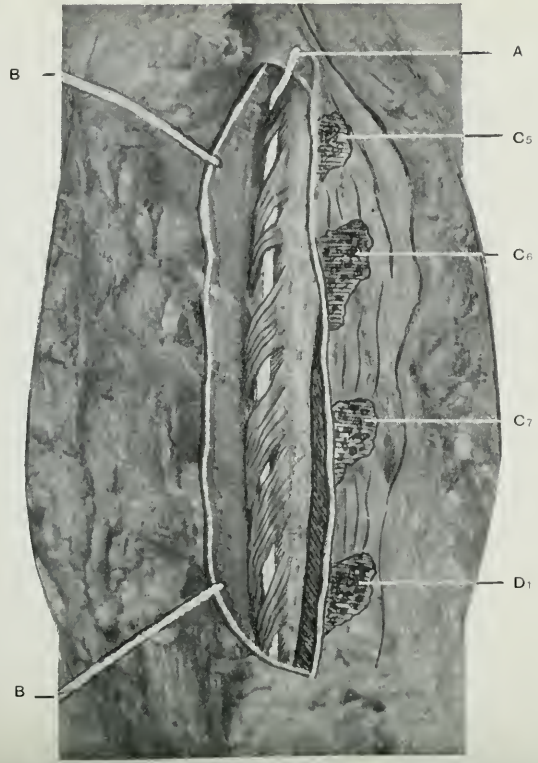


Fig. A.—Exposure of the brachial roots by hemilaminectomy of the 5th, 6th, and 7th cervical and 1st dorsal vertebræ. A white string (A) lies behind the roots. (B) tractors on the dura mater. (C_5, C_6, C_7, and D_1) the cut spinous processes of the vertebræ from the 5th cervical to the 1st dorsal. The highest root shown is the 5th cervical and the lowest the 2nd dorsal.

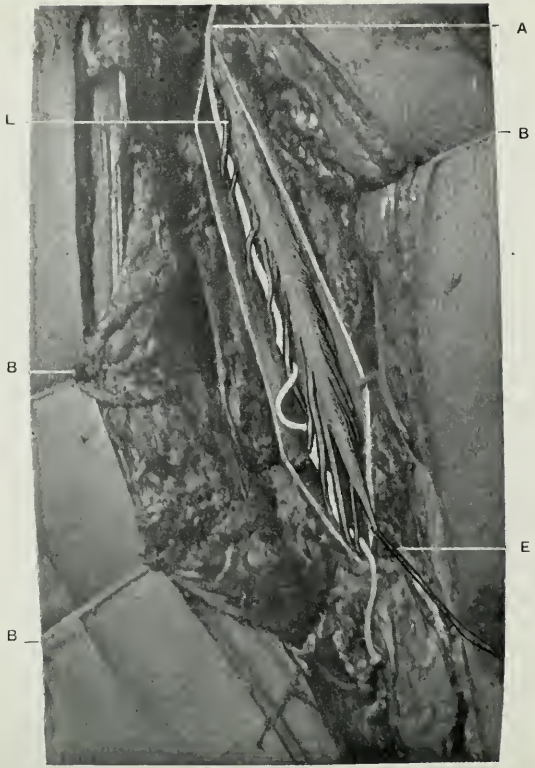


Fig. B.—Exposure of the lumbo-sacral roots by removal of the laminæ of the 11th and 12th dorsal and the 1st and 2nd lumbar vertebræ. A white string (A) lies behind the roots. (B) tractor holding the muscles aside. The nerve roots shown are those from the 1st lumbar to the fourth sacral inclusive. The filium terminale is held up by the thread (E). The highest root (L) is the 1st lumbar.

which the lumbo-sacral nerves are attacked at their origin from the lower end of the cord, instead of at their exit from the spinal canal. The accompanying *Plate XXXIV* illustrates the field of operation for both the cervical and lumbo-sacral regions. In the former, a hemi-laminectomy of the fifth, sixth, and seventh cervical, and first dorsal vertebræ serves to expose the posterior roots from the fifth cervical to the second dorsal inclusive, and by gentle traction on the cord the same roots on the opposite side can be dealt with. In the lumbo-sacral region, laminectomy of the last two dorsal and first two lumbar vertebræ gives access to all the lumbar and sacral roots at their junction with the cord. The determination of the exact roots can be made by counting upwards, it being borne in mind that the lowest root of considerable size is the third sacral. Wilms and Kolb suggest that it is unnecessary to count the roots, and they recommend division of rather more than half of all the rootlets composing each root.

Among French surgeons there is a disposition to follow Franke's method, and among others Maire and Parturier,[16] and Cade and Leriche[17] relate successful cases. This consists in **Avulsion of the Intercostal Nerves** (seventh to tenth dorsal) instead of resection of the posterior roots. This procedure tears out the delicate nerve roots and brings about a discontinuity of the afferent tracts without the difficulty and risk of opening the vertebral canal. But success must depend upon the nerve rupturing proximal to the ramus communicans of the sympathetic, and for this reason the method seems rather crude.

References.—[1]*Brit. Med. Jour.* 1912, i, 175; [2]*Amer. Jour. Med. Sci.* 1911, ii, 636; [3]*Ann. Surg.* 1912, i, 217; [4]*Jour. Amer. Med. Assoc.* 1912, i, 675; [5]*Clin. Jour.* 1912, ii, 95; [6]*Wien. klin. Woch.* 1912, 950; [7]*Münch. med. Woch.* 1912, 1720; [8]*N.Y. Med. Jour.* 1912, i, 729; [9]*Jour. Amer. Med. Assoc.* 1912, i, 238; [10]*Ibid.* 1911, ii, 1175; [11]*Ibid.* 1912, i, 1490; [12]*Ibid.* 1489; [13]*Münch. med. Woch.* 1912, i, 129; [14]*Lancet*, 1911, ii; [15]*Münch. med. Woch.* 1911, 1961; [16]*Presse Méd.* 1912, 585; [17]*Ibid.* 250.

SPINAL INJURIES. (*See* Spondylitis, Traumatic.)

SPLEEN, DISEASES OF. (*See also* Leukæmia.)

Herbert French, M.D., F.R.C.P.

Splenectomy has frequently led to the cure of so-called "splenic anæmia," and a number of cases of the kind have now been recorded. One of the most recent of these was under the care of G. Klemperer.[1] The patient was a man, aged thirty-six, who was exceedingly ill when he came under observation; he had become extensively anæmic, so weak that he could not work, and had lost 20 lb. in weight. The illness had been progressive for six months, and upon examination the chief features were a huge enlargement of the spleen, a considerable smooth enlargement of the liver, and a reduction of the red corpuscles to 2,500,000 per c.mm., whilst the white corpuscles numbered 5,000 per c.mm., without any particular abnormalities in the blood films. Under observation the spleen grew steadily bigger. The Wassermann reaction was not positive, and no evidence of syphilis could be found. Potassium iodide was administered for three months. Salvarsan was

injected and subsequent observation kept for eight weeks, but without any improvement. It seemed clear that the patient would die unless something radical could be done, and it was decided to remove the spleen by operation. Full details are given of the technique employed. The patient made an uninterrupted recovery, and six weeks after operation left the hospital with a red count of five and a half millions, and he had regained the 20 lb. weight that he had lost. At the time of the operation it was ascertained that the liver was not cirrhotic, but simply enlarged. There seems little doubt that the patient's life was saved by the splenectomy.

Micheli[2] now adds spleno-hæmolytic jaundice or *hæmolytic splenomegalic jaundice* of the Hayem-Widal type to the diseases which may be cured by splenectomy. The patient was a man, aged twenty-two, who, without any apparent cause, developed first a slight icteric tinge of his skin and conjunctiva, the coloration becoming progressively deeper, without pain or gastro-intestinal symptoms. His only other complaint was a feeling of lassitude and inability for sustained effort. He was in and out of hospital for three years without benefit, and with progressive deterioration in his general condition. He was not emaciated, but was anæmic and weak. The spleen came two fingers' breadths below the level of the umbilicus, and the liver was also enlarged, coming at different times from two to four fingers' breadths below the ribs. The heart presented a hæmic bruit, the blood-pressure was below the normal, the lungs were natural. The urine contained no bile pigment, though it was dark from the presence of an excess of urobilin, which varied in amount from time to time. The fæces presented no particular abnormality; they contained an abundance of stercobilin. The blood-counts varied considerably at different times, the red cells numbering from a minimum of 980,000 to a maximum of 2,600,000 per c.mm., whilst the white cells varied from 4,000 to 5,000 per c.mm. There was no notable departure from the normal in stained blood-films except a pronounced polychromatophilia, and the red corpuscles exhibited a tendency to ready hæmolysis. The Wassermann reaction was negative. Notwithstanding the absence of bile from the urine, the blood serum contained obvious bile pigment, and the case appeared undoubtedly to be one of splenomegalic hæmolytic acholuric jaundice, such as is generally familial. It was decided to excise the spleen. There was no post-operative oozing, the wound healed by first intention, and the patient seems to have been cured. The original should be consulted for a considerable number of references to other papers bearing upon the subject.

Although, in Klemperer's case already mentioned, salvarsan appeared to have no beneficial effect upon splenic anæmia, which was subsequently cured by splenectomy, other observers claim that injections of salvarsan in this disease may be very beneficial. F. Perussia and Carlo Vallardi[3] record cases so treated with satisfactory results.

References.—[1]*Berl. klin. Woch.* 1912, 1024; [2]*Wien. klin. Woch.* 1911, 1269; [3]*Münch. med. Woch.* 1912, 1482.

SPONDYLITIS, TRAUMATIC. *Herbert French, M.D., F.R.C.P.*

Delayed traumatic spondylitis, or Kümmel's spondylitis, is a condition of considerable interest both from the clinical and from the medico-legal points of view. Paul Rostaine[1] describes the main features of the affection, and the general impression as to the pathology of the condition is that the lesion is an originally unsuspected fracture of the body of a vertebra, followed by the formation of callus and the production of painful and other symptoms when the secondary changes in the region of the fractured body reach their height.

Etiology.—The cause is invariably a traumatism: sometimes a direct blow, at other times a distant shock, as for instance a fall on the ischia, or even forced incurvation accompanying an unusually violent muscular effort. The recollection of the traumatism may have escaped the patient's memory, especially when the characteristic symptoms are greatly delayed, and close cross-examination is required to bring it to light.

The *pathogenesis* of Kümmel's spondylitis has been much discussed. It is hardly doubtful that there is a vertebral lesion, as shown by the spinal curvature; the question is whether this curvature is there from the first or comes on later. Kümmel and Verneuil incline to the view of a primary fracture by crushing, the callus that subsequently forms being surrounded by a zone of rarefying osteitis under the influence of the traumatism, entailed by too early recourse to walking exercise. The bodies of the vertebræ yield, the posterior rachidian region (spinous process and lamina) retain their original height, hence a curve shown by their protrusion. This explanation, hypothetical at first, has been confirmed by radiography. It would appear, therefore, that Mickulicz's theory, according to which the rarefaction of the bones was due to nervous disturbances, must be discarded.

Symptoms.—At the onset, the patient complains of sharp pain in the dorso-lumbar region, or there may be creaking. He seeks repose, and even takes to his bed, a prey to genuine impotence caused by the pain. It may happen that the girdle pain suggests compression of the spinal nerves; or paresis, exaggeration of the reflexes, or disturbances of the sphincters lead us to suspect involvement of the spinal cord. All these symptoms, however, by-and-bye improve, the patient recovers the use of his lower limbs, and becomes capable of resuming his occupations.

So far there is nothing that particularly distinguishes these cases from simple contusion of the spinal column, but after a quiet interval of a few weeks the characteristic period supervenes. The pain recurs, and the patient assumes the horizontal position in order to obtain relief. Examined standing, he assumes a fixed bent attitude. Exploration then reveals the characteristic feature, viz., an angular deformity situated at the damaged spot, gently curved above and below. As a whole there is kyphosis or, less frequently, lateral deviation. Pressure and percussion over this spot cause pain, as

does even pressure exerted on the shoulders. Extension and suspension partially correct the deformity.

Radiography shows that the body of the vertebra at the site of injury has undergone changes. Sometimes we get symptoms of compression of the nerves similar to those of the first period: radiating pains with tremors, disturbances of the reflexes, sphincters, etc.

Rest in bed amends these symptoms; exercise and fatigue aggravate them. Under the influence of prolonged rest recovery gradually ensues, but for a long time the patient may experience some clumsiness in walking and in occupations entailing effort. No fatal case has been reported. It is impossible to assign any period of duration; before reaching the final stage the patient suffers for months or even years.

Diagnosis.—The general diagnosis is not difficult. The history of an injury and the relapse after apparent recovery, characterize it in view of the total duration. Nevertheless, the difficulties of diagnosis at the different periods may be considerable. No doubt it would be absurd to assume that every vertebral injury is going to give rise to Kümmel's syndrome, but the knowledge of these cases when the injury is severe calls for prudence in forecasting the subsequent history. We must admit that so-called traumatic lumbago is subject to revision. Later on, when the curvature appears, no doubt is possible. Pott's disease differs from traumatic spondylitis by the supervention of congestion abscesses, an inconstant but important symptom which should be sought after by careful exploration of the iliac fossæ; radiography will show several vertebral bodies to be attacked, though masked by the diffuse shadow of the abscess. The tuberculin reaction is sometimes of service; also the existence of slight fever with impairment of the general health. Syphilitic spondylitis is more apt to attack the cervico-dorsal region, whereas Kümmel's disease is in the dorso-lumbar region. Wassermann's reaction and the effects of treatment will help to settle the question. The kyphosis of acromegaly will be identified by the existence of changes in other parts of the skeleton.

The difficulties of diagnosis are increased in the absence of any spinal curvature. Imbert and Vial, who admit this possibility, hold that the diagnosis cannot be made until after prolonged careful observation, unless radiography affords evidence of changes in the vertebræ.

Prognosis.—In this connection the important points are the long duration of its course and occasionally the permanent impotence that follows. At the onset it is impossible to say anything definite; the progress of the impotence and the effects of treatment are important factors in the prognosis. What particularly contributes to obscure the diagnosis and the prognosis of this disease is that by virtue of its traumatic origin it is almost always the subject of a claim for damages, so that the good faith of the victim may be called in question. No doubt total simulation is rare, and it may be easy

enough to recognize by the irrational nature of the symptoms complained of.

TREATMENT.—This consists of **Prolonged Immobilization** in bed. When the pain has subsided, movement should not be resumed until after a still further period, and the patient must wear a plaster corset until complete recovery has taken place. If this treatment, thanks to radioscopy, were instituted from an early period, it is probable that Kümmel's syndrome would be even rarer than it is at present.

Calcium-free Diet recommended for spondylitis (*page* 7).

REFERENCES.—[1]*Med. Press*, 1912, i, 60.

SPOROTRICHOSIS. *E. Graham Little, M.D., F.R.C.P.*

The importance of this subject is illustrated in a paper by de Beurmann,[1] who has done so much to elucidate it. The wide distribution of the fungus which has been found as a saprophyte, the resistance to heat and cold (0° to 55° C.), and the survival for years in saprophytic growth, make the organism an especially dangerous one.

The most usual means of infection is by direct inoculation through a wound of the skin or mucous membrane. The organism may infect the skin, lymphatics, glands, and viscera, the eyes, articulations, bones, and muscles ; so that it is not the specialist but the general practitioner who most frequently meets with the disease, which has so long escaped identification because it resembles and is usually mistaken for syphilis or tubercle.

The following varieties are described :—

1. *Disseminated Gummatous Sporotrichosis.*—These are subcutaneous nodular swellings without definite arrangement ; they do not ulcerate so as to involve the skin, but become cold abscesses which do not evacuate spontaneously.

2. A type in the first stages simulating the first group, but undergoing *ulceration* producing fistulous openings, large tubercular ulcerations, or lesions resembling gumma, rupia, or ecthyma.

3. *Mixed forms*, in which large subcutaneous cold abscesses, gummatous lymphangitis, papules, vesicles, vesico-pustules, lupoid infiltration, verrucose masses, acneiform, and many other types of lesion may be present.

4. *Localized Sporotrichosis* (sporotrichotic chancre, lymphatic sporotrichosis). This occurs when the skin has been directly inoculated, and small secondary tumours may spread up the lymphatic channels.

" The following are the characters which permit us to recognize the manifestations of sporotrichosis :—

The large number of lesions, contrasting with the preservation of a good general state of health.

Partial cup-shaped softening of a node, which is at first indurated, and of which the centre breaks down.

Slight ulceration, which enlarges secondarily.

Irregular and violaceous edges, almost always undermined, covering subcutaneous recesses, in which pus accumulates.

The contrast between the small area of the ulceration and the size of the gumma from which it arises.

The co-existence of several contiguous ulcerations, separated by a slender bridge of violaceous skin, over one and the same gumma.

Viscous pus, or lemon-yellow serous discharge.

The ease with which autoinoculation occurs.

' Cold ' and indolent evolution.

The cicatrization of the skin, in spite of the persistence of an abscess under the cicatrix.

Smooth elastic cicatrices, with irregular edges, and often with denticulation of badly attached cutaneous tags surrounded by a brown pigmented area.

The constant absence of enlarged glands.

" If a patient in whom such symptoms have made one suspect sporotrichosis recovers very rapidly under iodine treatment, local and general, the diagnosis is almost certain, and the physician may finally content himself with this clinical quasi-certainty."

The demonstration of the presence of the parasite is best made by producing cultures of the organism in the *cold* on Sabouraud's glucose-peptone-gelatine ; minute directions for performing this are given in the original paper, but are too lengthy to detail here.

Treatment.—**Potassium Iodide** should be given internally in increasing doses, up to 6 grams a day or more ; the local lesions should be dressed with **Iodine** solution (iodi gr. 1 ; pot. iod. gr. 10 ; aq. 1 oz.). Ulcerated points may be cauterized with pure tincture of iodine. Surgical measures of all kinds must be avoided. The cure is generally complete in a few weeks.

Reference.—[1]*Brit. Med. Jour.* 1912, ii, 289.

Herbert French, M.D., F.R.C.P.

Arthritis due to sporotrichotic infection is becoming recognized with increasing frequency, particularly in France, another case being recorded in detail by Sorrel and Verdun.[1] Such cases are apt to be mistaken for syphilis particularly, because they may be associated with chronic ulcerating gumma-like lesions of the skin in other parts of the body, and because they may become perfectly well when treated with large doses of iodide of potassium. Syphilis can be excluded, however, by finding that the serum is entirely negative to Wassermann's test, whilst on the other hand it will agglutinate cultures of the causal fungus even when diluted to 1 in 800.

Reference.—[1]*Rev. de Chir.* 1911, 443.

SPRUE. *Leonard Rogers, M.D., F.R.C.P.*

G. C. Low[1] records the *blood-changes* in four cases of sprue. He found little alteration in the early stages, but a progressive secondary anæmia with a diminution of the leucocytes, and eventually there may be a severe anæmia simulating the pernicious type.

TREATMENT.—C. Begg and B. Preston Maxwell[2] write further on the use of **Chromosantonin**, by which they mean the ordinary santonin exposed to the sun until it becomes yellow throughout, a matter of some months in England, but only a few weeks in the tropics. They claim that in not too advanced cases of sprue, gr. 5 twice a day, for from four to seven days, will cure most cases very rapidly, although it may have to be repeated if relapse occurs, which is not often the case in their hands. They have also found it effective in some forms of unclassified diarrhœas and chronic dysentery, especially those of the bacillary type, but not in the amœbic form.

REFERENCES.—[1]*Jour. Trop. Med. & Hyg.* 1912, 129; [2]*Chin. Med. Jour.* 1911, 374.

SPUTUM, EXAMINATION OF. *Oskar C. Gruner, M.D.*

Tubercle Bacilli.—The acetone-antiformin method is convenient for those who have no centrifuge. The ordinary treatment with antiformin (= 15 per cent liq. sodæ hydrat. and liq. sodæ chlorinat., equal parts)—shaking for five minutes, then diluting with ten volumes of distilled water, and again shaking, is followed by adding a mixture of equal parts of methylated ether and acetone equal in volume to that of the water. After shaking, the middle layer of the mixture (a dense white ring) is pipetted off, and films are made in the usual way (Eurich[1]).

Nemmser and Martos-Lissowska,[2] searching for other methods of detecting tubercle bacilli in sputum, in which the centrifuge, filter paper, or shaking can be dispensed with, arrived at the following:—

(*a*). *Alkaline Trypsin Digestion* (modification of Spengler's method).—Five c.c. of 0·4 per cent soda are added to 5 c.c. of sputum; 0·1 c.c. trypsin or pancreatin, and two or three drops of chloroform are added. This is corked and incubated. The tube must be agitated occasionally during the first five hours. Next day the supernatant fluid is poured off, and the residue used for making smears.

(*b*). *Acid Trypsin Digestion.*—Five c.c. of 0·4 per cent of hydrochloric acid are added to 5 c.c. of sputum, shaken, and trypsin added later. Incubate and treat as in method (*a*).

(*c*). *Acid Oxidation.*—Five to ten drops of *hyper*chloric acid are added to 5 c.c. of sputum. This is made up to 10 c.c. with water, and incubated. The treatment next day is as in method (*a*).

Williamson[3] recommends the following method (Löffler's). To a given amount of sputum is added an equal amount of 50 per cent antiformin, and the mixture placed in a Jena glass flask and brought to the boiling-point. This occurs with the production of much foam, and even the toughest and most purulent sputa promptly go into solution. To each 10 c.c. of the resulting solution is added 1·5 c.c. of a mixture of one part chloroform and nine parts alcohol. This is then violently shaken (best in a 25 c.c. glass-stoppered measuring cylinder) for about two minutes, or until thorough emulsification has taken place. This ensures the impregnation of the lipoid capsules of

the bacilli with chloroform, whereby their specific gravity is greatly increased. The alcohol assists in the emulsification. This emulsion is now centrifuged. In the bottom of the tube will be found a few drops of clear chloroform, then a firm narrow disc of sediment, sufficiently tenacious to be capable of removal *en masse*, and above this a thin fairly clear fluid. The small disc (which contains undissolved matter and the tubercle bacilli) is now removed *in toto*, placed on a slide, the excess of antiformin removed by a bit of filter paper, a small drop of egg albumen added and well mixed by the aid of a platinum loop, and the whole spread between two slides. These are then fixed by passing through the flame, and are stained in any way desired.

Precautions.—The antiformin must be fresh and active, and should be kept in the dark. Any sample which does not readily dissolve the sputum when brought to the boiling-point is worthless. The emulsification should be thorough. The fixative should be egg albumen, to which is added 0·55 per cent phenol (carbolic acid) as a preservative. Fixatives containing glycerin are not suitable. In the preparation

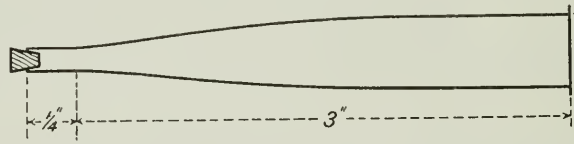


Fig. 99.—Williamson's Centrifuge Tube.

of this albumen, the phenol should be diluted to 1 per cent and added from a burette drop by drop, with constant stirring, to the white of egg, until the proper amount has been added.

This author has devised a special form of centrifuge tube (*Fig.* 99), which is open at both ends, the lower end being closed by a rubber stopper such as is used in hypodermic phials. This is convenient for obtaining the little disc of sediment entire.

Albumin Reaction.—Observations by Nathan Raw[4] on 110 cases have shown that the albumin reaction is a satisfactory adjunct to the diagnosis of *tuberculosis* before any physical signs appear in the lungs. The simplicity of the test makes it more practicable than the von Pirquet test. Raw's technique is as follows: 5 c.cm. of the sputum are mixed with 20 c.cm. of physiological salt solution in a test tube; five or six drops of acetic acid are added, and the whole shaken up well and then filtered. The filtrate is then tested for albumin by heat or nitric acid. The amount of precipitate depends on the amount of albumin present. The test for Roger's albumin reaction in sputum, as described by Levy-Valensi,[5] differs slightly from the above. He states that the presence of albumin in the sputum does not necessarily mean tubercle. It is met with also in pneumonia, broncho-pneumonia, pulmonary œdema, gangrene, cardiopathies, and renal affections.

Fishberg and Felberbaum[6] found cases of undoubted phthisis in

which albumin was not present in the sputum. Moreover, the amount of albumin bears no relation to the stage of the disease. They point out that the source of the albumin in pulmonary tuberculosis is probably tuberculous ulceration of the bronchi and pulmonary parenchyma. In advanced cases, these ulcers are often healed by the formation of fibrous tissue, so that the sputum secreted is of about the same character as that in simple catarrh of the respiratory tract. On the other hand, they say that the test will very often shed some light on a case which may otherwise prove puzzling.

Fullarton[7] studied many cases in order to ascertain, if possible, the real value of the albumin test. He found that albumin was absent or inconsiderable in 50 per cent of phthisical cases, and 86 per cent of non-phthisical cases. It was considerable in 50 per cent of phthisical cases, and 14 per cent of non-phthisical cases. There is much albumin in acute bronchitis, in pneumonia during the febrile stage, in pneumonia during the resolution stage, and in bronchiectasis. On the other hand, if much albumin is present in a case of bronchial catarrh not due to these causes, tuberculosis should be suspected. This writer comes to the only adequate conclusion, that the test is of but limited value.

According to Pacini,[8] the following chemical test is of value in the diagnosis of incipient pneumonia before the classical rusty sputum appears. Mix one volume of sputum with ten volumes of water, and shake thoroughly for five minutes. To a test tube containing 10 c.c. of distilled water add five drops of 1 per cent aqueous methyl violet, and shake. The watery mixture of sputum is now poured into a filter, and ten drops are allowed to fall into the test tube. If a red colour appears, pneumonia is present.

References.—[1]*Brit. Med. Jour.* 1911, ii, 596; [2]*Deut. med. Woch.* 1911, 1697; [3]*Jour. Amer. Med. Assoc.* 1912, i, 1005; [4]*Brit. Med. Jour.* 1911, ii, 1470; [5]*Med. Press and Circ.* 1912, i, 506; [6]*Med. Rec.* 1911, ii, 870; [7]*Glasg. Med. Jour.* 1912, ii, 8; [8]*Interstate Med. Jour.* 1912, 536.

STATUS LYMPHATICUS. *Herbert French, M.D., F.R.C.P.*

Lymphatism, or status lymphaticus, is a condition in which the writer puts very little faith as being the real explanation of the many deaths that are being attributed to it now-a-days; for when one does large numbers of post-mortem examinations upon children and young adults who have been killed by being run over by motor cars when in robust health, one quite frequently finds all those changes which, had they been found in persons who had died under an anæsthetic, or from some other cause which ought not upon the face of it to have led to death, would have been called status lymphaticus. Therefore one cannot help thinking that what had been called lymphatism is really a nearer approach to the normal than that which is found in bodies of persons who have died of actual disease. These views, however, are not shared by most pathologists now-a-days, and there are some who believe that lymphatism is not confined to white races, but is present also in the coloured nations of the East. Captain A. Whitmore, I.M.S.,[1] records sixteen such cases in which he states that

he found lymphatism post mortem. That he found the changes which are said to be characteristic of lymphatism may be granted ; but in view of the fact that these were found in persons who had died from such ordinarily fatal causes as drowning, stabbing, cocaine poisoning, aortic disease, and so forth, one cannot but think that these cases support the view that so-called lymphatism with comparatively large thymus gland and comparatively big internal and external lymphatic glands and prominent lymphoid tissue in the alimentary canal, is really not necessarily abnormal. The subject is one for discussion.

Reference.—[1]*Lancet*, 1911, ii, 752.

STOMACH, CIRRHOSIS OF. *Robert Hutchison, M.D., F.R.C.P.*

Lyle[1] has published an excellent review of the whole subject of *linitis plastica*, along with a very full bibliography. His paper does not lend itself to a summary, but the following conclusions may be stated : (1) Diffuse fibrosis of the stomach occurs without cancer. (2) A large number of the reported cases are really malignant and have no claim to be termed linitis plastica (*see Plate XXXV*). (3) The clinical diagnosis is rarely possible, and the microscopical diagnosis necessitates a careful and prolonged search for nests of cancer cells in order to exclude scirrhus. (4) It is possible that the condition may be a pre-cancerous state, bearing somewhat the same relation to scirrhous cancer that gastric ulcer bears to gastric carcinoma.

Reference.—[1]*Ann. Surg.* 1911, 625.

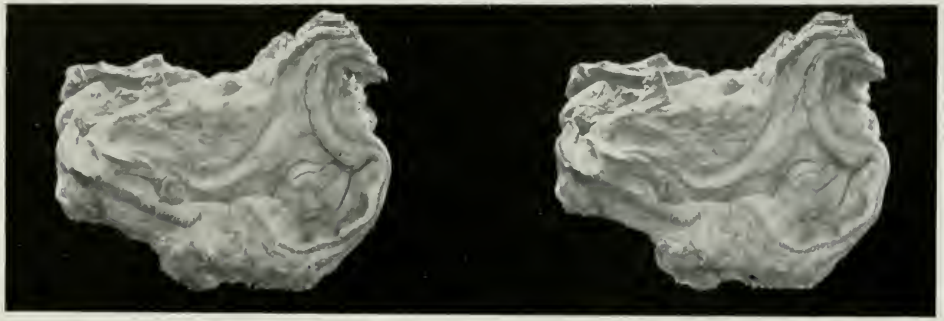
STOMACH, DISEASES OF. (*See also* Gastric Contents ; Pylorus, Congenital Stenosis of ; Stomach : Cirrhosis of ; Malignant Disease of ; *and* Ulcer of.) *Robert Hutchison, M.D., F.R.C.P.*

1. *Acute Dilatation.*—Box and Wallace[1] have brought forward six additional cases which, in their opinion, support their former contention that the pressure exerted on the duodenum by the dilated stomach is an important factor in the production of obstructive symptoms. The compression must of necessity be greater before the abdominal cavity is opened, owing to the resistance and counter-pressure exercised by the abdominal muscles. For this reason, experiments on the cadaver with the stomach exposed only reproduce in an imperfect manner the conditions present during life. Beyond reiterating the importance of combining **Lavage** with the **Prone Position,** they have nothing to add as regards treatment.

2. *Hyperacidity.*—The term *larval hyperacidity* was introduced by Schöler[2] to designate a condition in which the patient exhibits the *symptoms* of hyperacidity, but in which a test meal reveals no excess of acid on chemical examination. It was at one time believed that this anomaly was to be explained by the existence of a hyperæsthesia of the gastric mucous membrane to normal degrees of acidity of the contents, but it would appear from recent investigations by Frieden-

PLATE XXXV.

CANCER OF STOMACH, SIMULATING LINITIS PLASTICA



Bristol General Hospital, No. 3401. *Photograph. Geo. Scott Williamson, Pathologist.*

wald[3] and others that there is a true hyperacidity in these cases which, however, is not revealed by the ordinary test meal, inasmuch as the maximum acidity is reached unusually early in digestion and is subsequently neutralized.

Under normal conditions, after a Riegel test dinner, the total acidity attains its height in from 180 to 210 minutes, and the free hydrochloric acid in from 180 to 200 minutes. In larval hyperacidity this occurs much earlier, with the total acidity in from 80 to 120 minutes, and with the free hydrochloric acid in from 80 to 110 minutes. The free hydrochloric acid, which under normal conditions first manifests itself in about 30 minutes after an Ewald test breakfast, and in about 130 minutes after a Riegel test dinner, reveals itself in larval hyperacidity in from 20 to 22 minutes after an Ewald breakfast, and in from 36 to 45 minutes after a Riegel dinner. In larval hyperacidity the total acidity may reach 68 and the free hydrochloric acid 0·22 per cent, while in from 45 to 60 minutes after a test breakfast, or 180 to 210 minutes after a test dinner, the curve of the acidity has already fallen quite markedly.

The diagnosis of larval hyperacidity does not usually present any difficulty. The symptoms of hyperacidity which arise early in the period of digestion, together with the characteristic features of the gastric contents, the large amount obtained consisting mainly of a watery secretion, with a low specific gravity, and with a normal acidity, and presenting the amidulin reaction, distinguish this condition from the usual forms of hyperchlorhydria. The absence of an epigastric painful area, as well as the absence of occult blood in the stools, distinguish it from gastric ulcer. Larval hyperacidity is differentiated from digestive or alimentary hypersecretion of gastric juice, with which it has many symptoms in common, by the presence of a hyperacidity during the early period of digestion, but which tends to become normal at that period when test meals are ordinarily withdrawn.

Treatment.—This should be largely directed to the management of the nervous system. In emaciated individuals the best results are obtained by means of a systematic **Rest-cure** treatment. The **Diet** should consist largely of three meals a day, together with intermediate feedings of liquid food. It should contain an excess of proteids and fats, and but a moderate quantity of carbohydrates. Of the various proteid foods, milk, eggs, and fish are to be preferred. Fats have a tendency to decrease the gastric hyperacidity, and are to be recommended. Of these, butter, cream, and olive oil are especially useful. The carbohydrates are only permissible in the most digestible forms, and vegetables should be mashed and strained, and taken in the purée form, free of all cellulose. **Water** is usually well borne, and may be administered in large quantities, with benefit. All acid food, as well as stimulants, should be avoided. The **Alkalies,** together with **Belladonna,** are of great service. Good results are usually obtained from **Hydropathic measures,** as well as from **Massage.**

Peroxide of Hydrogen in $\frac{1}{4}$ to $\frac{1}{2}$ per cent solution has the power —like oil—of greatly lessening gastric secretion. It has been used for this purpose on the Continent in cases of hyperacidity and gastric ulcer, and has been extolled by some observers. Winternitz,[4] however, has abandoned its use, as he finds that the results are not permanent, and to many patients the solution is disagreeable to take. Hall,[5] who has tried it in a considerable number of cases, did not get on the whole such good results as have been reported, although patients with hyperchlorhydria obtain great relief from its use. It did not seem to be of any use in active ulcer.

3. *Gastrogenic Diarrhœa in Pyloric Stenosis.*—The occurrence of gastrogenic diarrhœa in cases of achylia is well known, but Boas[6] describes a case in which it occurred as the result of malignant stenosis of the pylorus. Seeing that the stomach contents contained plenty of HCl, absence of the latter could not have been the cause of the diarrhœa in this case, but as some sarcinæ were found in the stools, the author is inclined to attribute it to abnormal fermentation in the bowel. The diagnosis of such cases is difficult, for the diarrhœa may dominate the clinical picture and lead to the primary cause being overlooked.

The *treatment* must, of course, be directed mainly to the gastric condition, but he believes in **Salicylate of Magnesia** in doses of 30 to 45 gr. daily as a valuable anti-fermentative.

4. *Spastic Hour-glass Stomach in Affections of the Duodenum.*—Baron and Barsony,[7] from their own experience and from a study of the literature of the subject, have come to the conclusion that the spastic hour-glass stomach is a symptom of disease in the duodenum in many cases. If in addition to the hour-glass contraction, symptoms of duodenal ulcer be present, and if the stomach is empty after six hours, one may conclude that this is an affection of the duodenum uncomplicated by organic disease of the stomach.

References.—[1]*Lancet*, 1911, ii, 214; [2]*Deut. med. Woch.* 1900, 303; [3]*Amer. Jour. Med. Sci.* 1911, ii, 157; [4]*Deut. med. Woch.* 1911, 1390; [5]*Bost. Med. and Surg. Jour.* 1911, ii, 15; [6]*Berl. klin. Woch.* 1912, 337; [7] *Wien. klin. Woch.* 1912, 1185.

STOMACH, MALIGNANT DISEASE OF.

(*See also* Gastric Contents.)

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Sarcoma.—Gosset[1] records a case of sarcoma of the stomach, and adds others from the literature, bringing the total of known cases up to 171. His patient had suffered from digestive troubles, chiefly a sense of weight in the stomach after food, for about four years. He had noted a lump in the abdomen for six months. He suffered no great pain, there was no sickness, and his appetite remained good though he was much wasted. Examination showed a firm movable tumour in the epigastrium, not intimately connected with the liver. At operation it was found to be a solid tumour growing on the posterior face of the lesser curvature. The stomach was stretched

out into a narrow channel around the lower border of the tumour. The mass was excised with the segment of stomach embracing it, the two cut ends being sutured together. A gastroenterostomy to the cardiac pouch was performed three days later. From this the patient made a good recovery. The tumour proved to be a myosarcoma growing from the muscular wall of the stomach.

Metastases, most frequent in the liver and regional nodes, are much less commonly met with than in carcinoma. The question of resection of a gastric sarcoma will be generally decided by the extent of its adherence to surroundings. Sarcoma of stomach rarely affects the orifices, hence vomiting is uncommon. In two cases the cardia was affected. Sixty-one cases have been operated upon. Thirty-nine of these were exogastric tumours, and among these were 29 gastrectomies with 10 deaths. There were 13 gastrectomies among the 22 cases of endogastric tumours, with 5 deaths.

Carcinoma.—A study of 200 resected specimens of gastric carcinoma, with special reference to lymphatic involvement, led MacCarty and Blackford[2] to the following conclusions: the size of the regional lymphatic glands bears no apparent relation to that of the primary lesion, nor is the size of a lymphatic gland any criterion of the presence or absence of cancer; the duration of symptoms bears no apparent relation to the size and extent of involvement of the lymphatic glands; and the immediate and subsequent mortality after operation is in direct proportion to the amount of glandular involvement.

References.—[1]*Presse Méd.* 1912, 221; [2]*Ann. Surg.* 1912, i, 811.

STOMACH AND DUODENUM, ULCER OF.

Sir B. G. A. Moynihan, M.S., F.R.C.S.
H. Upcott, F.R.C.S.

Among a thousand cases of indurated ulcer of stomach and duodenum operated upon by the Mayos,[1] over 57 per cent were duodenal and nearly 43 per cent gastric. [This probably under-estimates the proportion of duodenal ulcers. It is more likely that two out of three cases will be duodenal.—B. G. A. M., H. U.] The acute mucous toxic ulcers are apparently quite distinct from the chronic indurated ulcer, which is almost always single. There is no evidence to show that one form develops into the other. Of the 1000 cases, 745 were men.

Symptoms.—The symptoms of ulcer in the neighbourhood of the pylorus are fairly definite, but the history of ulcer of the body of the stomach (pain within one hour of eating, and passing to the left in the region of the body of the pancreas) is often confused. The results of surgical treatment are best in those ulcers near the pylorus treated by gastro-enterostomy, while ulcers of the body of the stomach give the best results when treated by excision combined with gastroenterostomy.

Mitchell[2] says the important symptoms in chronic ulcer are: (1) Pain. This is the only symptom common to all cases; to be of diagnostic

value it must bear a definite relation to the taking of food. The regular onset of pain in the night is of the greatest importance ; (2) Local tenderness on deep pressure is a sign whose value cannot be over-estimated. It occurs in about 10 per cent of cases, and indicates some local acute peritonitis around the ulcer. Tenderness is a danger sign, and when severe and persistent, is one of Nature's calls for help ; (3) Local hyperæsthesia is found in 3 per cent of cases, and is valuable as eliminating neurosis ; (4) Hæmorrhage occurs in about 40 per cent of cases.

The value of *X-rays in diagnosis* is discussed at *page* 52.

TREATMENT.—The surgical treatment should be **Gastro-enterostomy,** with excision or infolding of the ulcer. Where the pylorus is not narrowed, it should be partially closed by sutures. If excision of the ulcer is difficult, Mitchell is content to infold it, but in either event gastro-enterostomy should be performed.

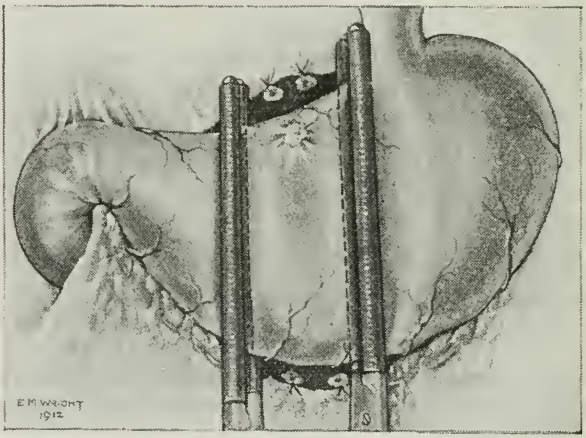


Fig. 100.—Modified partial gastrectomy for ulcer on the lesser curvature of the stomach.

Many surgeons have found that the results of gastro-enterostomy, when performed for chronic ulcer situated high up on the lesser curvature or in the body of the stomach away from the pyloric portion, are often disappointing. It has been thought better in these cases to excise the ulcer, either with or without the performance of gastro-enterostomy, according to circumstances.

According to Dobson,[3] excision of the ulcer would seem to be the ideal operation ; the diseased part is freely removed and the possibility of secondary malignant disease is avoided. He reports fourteen cases. In ten the ulcer was resected, gastro-enterostomy not being performed. In five of these the result was satisfactory. Recurrence of ulceration occurred in four after an interval of from six to twelve months from the first operation. One of these died from perforation

of the ulcer. In two cases a secondary gastro-enterostomy was performed with a satisfactory result; and in the fourth case a segmentary resection of the stomach with gastro-enterostomy led to a cure. In one case adhesions caused a return of symptoms five months after excision of the ulcer; gastro-enterostomy was then performed, but did not give relief.

Resection of the ulcer was combined with anterior gastro-enterostomy in one case. A second operation was required five months later, when a jejunal ulcer was found. The anastomosis and a segment of the stomach were excised with a good result.

In the three remaining cases segmentary resection of the stomach, with closure of the ends and gastro-enterostomy, was performed as the primary operation. The result in all three cases was quite satisfactory. (*See Figs* 100, 101.)

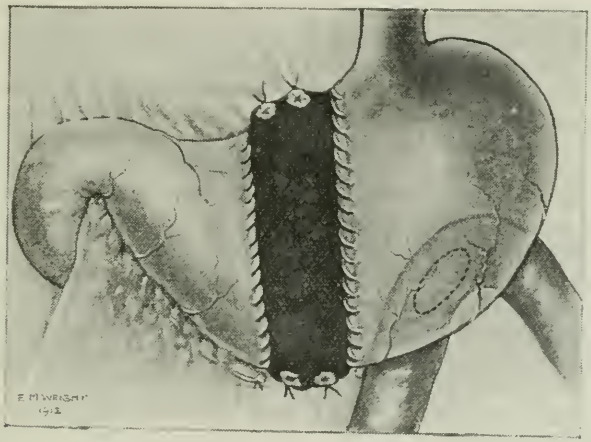


Fig. 101.—Modified partial gastrectomy completed by a gastro-enterostomy.

Dobson concludes that excision of an ulcer of the body of the stomach or lesser curvature is unsatisfactory. If the patient is able to stand a fairly severe operation, he thinks that segmentary resection of the stomach, with gastro-enterostomy, is the most suitable method.

Hour-glass Stomach.—Barjon and Delore[1] advocate a more radical treatment than the anastomotic procedures commonly adopted. The chronic ulcer causing the stricture is usually unhealed when the patient calls for relief, and these authors think that its excision will give the greatest benefit. If the constriction between the gastric pouches is situated near the pylorus, resection of the pyloric end of the stomach, followed by gastro-enterostomy or gastro-duodenostomy, is indicated. If the pyloric pouch is of considerable size, they recommend segmentary resection with suture of the two pouches together.

Telford and Radley[5] consider that the treatment of *posterior duodenal ulcers* which have perforated into the retroperitoneal tissue is not so satisfactory as that of the more frequent anterior perforations. The majority of such cases are not seen until a retroperitoneal abscess has formed. This is incised at some convenient point; the bulk of the food, together with quantities of bile and pancreatic juice, continue to pour from the opening, and before many days have passed the patient is dead. Admitting the difficulty of an accurate diagnosis in these cases, the writers nevertheless suggest the wisdom of an attack upon the ulcer itself. The descending portion of the duodenum should be mobilized by an incision through the posterior peritoneum along its outer side, and the ulcer sutured. They report a case in which this suggestion was carried out, but only as a last resort and with a fatal result.

Jejunal Ulcer.—This is the most serious complication after gastro-enterostomy at the present time (Moynihan[6]). It follows all types of gastro-enterostomy, but appears to be most frequent after the anterior operation. In most cases the ulcer occurs on, or very close to, the suture line. Clinically, there are four groups: (1) Rapid development with perforation shortly after operation; (2) The ulcer develops a few weeks or months after the operation, and the symptoms suggest a recurrence of the original trouble; (3) A gradual development, with subacute perforation causing a palpable inflammatory tumour in the epigastrium; (4) Chronic perforation into a hollow viscus. Most cases belong to the second and third groups.

The TREATMENT of jejunal ulcer should, if possible, include resection of the affected segment of bowel, together with a portion of the stomach wall, followed by the formation of a new anastomosis. According to Mayo Robson,[7] the operation of jejunostomy may be of value in this condition.

Acute Gastroduodenal Dilatation is a well-recognized complication following operations upon the abdomen. The cause is generally admitted to be an obstruction of the third part of the duodenum by the root of the mesentery—gastromesenteric ileus. It may also arise independently of operation.

The TREATMENT is early **Gastric Lavage,** which is usually successful. If the obstruction persists in spite of repeated washing out, Bloodgood[8] advises an anastomosis between the duodenum and jejunum, a procedure which has been carried out by Stavely.

Bloodgood recognizes another type of duodenal dilatation, which he terms chronic gastromesenteric ileus. He suggests that this is due to the pull of a distended cæcum transmitted through a short ileal mesentery, thus causing pressure upon the third part of the duodenum. The symptoms, which may be present only when the patient is up and about, are chiefly gastric, and there is vomiting of material containing bile and duodenal contents. Bloodgood has had five cases of chronic mesenteric ileus which he has treated by resection of the right half of the colon followed by ileocolostomy. Four of the cases

have been completely relieved of their symptoms; one is not yet fully relieved.

References.—[1]*Ann. Surg.* 1911, ii, 313; [2]*Ibid.* 806; [3]*Brit. Med. Jour.* 1912, ii, 864; [4]*Lyon Méd.* 1912, i, 1052; [5]*Brit. Med. Jour.* 1912, i, 1002; [6]*Univ. Med. Rec.* 1912, i, 11; [7]*Brit. Med. Jour.* 1912, i, 1; [8]*Jour. Amer. Med. Assoc.* 1912, ii, 117.

SUNSTROKE. (*See* Heat Stroke.)

SUPRASCAPULAR NERVE, PARALYSIS OF.

Purves Stewart, M.D., F.R.C.P.

Etiology.—The suprascapular nerve arises from the fifth cervical root (before it joins with the sixth to form the middle cord of the brachial plexus) and, passing through the suprascapular notch, is distributed to two muscles—the supra- and infraspinatus. Paralysis of the suprascapular nerve is relatively uncommon. Nevertheless, Guibé,[1] of Paris, has recently collected twenty-six cases, partly from the literature, and partly from his own experience. Two varieties of paralysis are to be distinguished: those due to an isolated lesion of the suprascapular nerve-trunk itself, and those due to a lesion of the fifth cervical root above the point of origin of the nerve. There is usually little difficulty in distinguishing between the two, since in lesions of the fifth root other muscles (notably the deltoid, biceps, and supinator longus) are affected together with the supra- and infraspinatus, whereas in a pure lesion of the suprascapular nerve these two muscles are exclusively implicated. The sole difficulty occurs when a fifth root lesion clears up partially, leaving the suprascapular fibres permanently paralyzed, but here the history of the original more widely-spread paralysis will guide us, together with the fact that cutaneous sensory changes in the form of anæsthesia are not uncommon in root lesions, whereas in suprascapular palsy the symptoms are purely motor.

Two main causes produce suprascapular palsy: traumatism, and neuritis, the former being the commoner (fifteen cases out of twenty-six). The commonest injuries are: falls on the upper part of the shoulder, on the elbow, or the extended and abducted hand; a sudden violent movement of the arm backwards and upwards; less frequently the falling of a weight on the upper edge of the scapula. The writer saw a case recently in which the patient, an athletic young man, suddenly felt something give way when he was doing a gymnastic feat which consisted in supporting himself upon one hand and both feet, with the other arm behind his back, whilst he endeavoured to pick up a small object from the ground with his teeth. The nerve may be compressed or stretched, sometimes compressed between the clavicle and the scaleni muscles. Spontaneous neuritis of the nerve is often ascribed to rheumatism; sometimes it is syphilitic. The writer has seen a case following enteric fever.

Symptoms.—These are entirely motor. They consist in weakness of abduction and of external rotation of the shoulder joint. Some-

times, when the arm is not loaded, the patient notices nothing abnormal, but as soon as he tries to abduct the limb against resistance, there is a sense of fatigue with weakness. No individual movement is paralyzed, since abduction can still be performed by the deltoid, and external rotation by the teres minor. The most characteristic sign is demonstrated by asking the patient to abduct both shoulders slowly and simultaneously, when just as the affected limb reaches the horizontal, there is a sudden snap or click of the joint. This was supposed by Bernhardt to be due to slight initial subluxation of the shoulder joint due to paralysis of the supraspinatus, regarded as the active superior ligament, so that when the arm reaches the horizontal, the head of the humerus suddenly slips up again into the glenoid cavity. Guibé, however, offers an entirely opposite explanation, and maintains that there is no subluxation until the arm reaches the horizontal, when it tends to slip downwards a little from want of the fixing and supporting action of the supraspinatus. Deficient external rotation at the shoulder joint renders certain movements difficult, such as writing or sewing. But the most striking sign of all is the wasting of the supra- and infraspinatus, with flattening of the supra- and infraspinous fossæ. The spine of the scapula is abnormally prominent. The flattening of the infraspinous fossa is especially evident, since this muscle is subcutaneous, and on palpation the finger seems to sink directly on to the bone, whereas the supraspinatus is partly covered by the trapezius, which tends to conceal the atrophy of the subjacent muscle. Lastly, the wasted muscles, if the paralysis has lasted ten days or more, show the familiar electrical reactions of degeneration.

PROGNOSIS.—This varies according to the degree of damage to the nerve fibres. Rupture of the trunk is not likely to recover spontaneously, whereas neuritis or bruising without loss of continuity has a relatively better prospect of cure.

TREATMENT.—This consists in **Massage** and **Electrotherapeutics.** If these fail, and there is evidence of a complete division or profound degeneration of the nerve, we may still offer the patient the chance of **Surgical Interference.** Suture or grafting of the nerve-trunk is rarely worth attempting, owing to the difficulty of identifying the site of injury. Better results are obtained by muscle transplantation, replacing the supraspinatus by the acromial part of the trapezius, and the infraspinatus by a portion of the latissimus dorsi.

REFERENCE.—[1]*Presse Méd.* 1912, 161.

SYCOSIS.

X-ray application may be combined with other remedies (*page* 59); and **Zinc Ionization** is also of value (*page* 72).

SYPHILIS. (*See also* CARDIAC SYPHILIS; LUNGS, SYPHILIS OF; *and* SYPHILIS, CONGENITAL.) *C. F. Marshall, M.D.*

ETIOLOGY.—Noguchi[1] claims to have succeeded in making pure *cultures of the Spirochæta pallida*, both from experimental syphilitic orchitis of rabbits, and from human chancres and condylomata. The

methods differed, but the cultures thus obtained from rabbit and human material were identical in morphological and cultural characters. The spirochæte is unaerobic, and requires fresh sterile tissue for its development. The cultivated spirochæte is less active, but has the characteristic movements of *S. pallida*. Cultures obtained from rabbit's testicle produced typical orchitis in rabbits, and human cultures produced chancres in monkeys, when inoculated. The fact that the specific serum reactions were mutually interchangeable between the cultivated and the tissue *S. pallida*, establishes their identity. It was also found that the rabbits sensitized with spirochætes from rabbit's testicle by repeated inoculation, showed a cutaneous reaction to the cultivated *S. pallida* extract (luetin) as well as to tissue extract, but not to extracts of *S. dentium* or *S. refringens*. This apparently indicates that the spirochæte cultivated by Noguchi is identical with that found in syphilitic tissues.

His results are not, however, confirmed by Levaditi and Danulesco[2] who, after examining the spirochæte cultivated by Noguchi, conclude that it differs morphologically and biologically from the *S. pallida*, and that it is not pathogenic for the rabbit, guinea-pig, mouse, or ape, and does not protect the rabbit from infection by the syphilitic virus. They regard it as a saprophytic spirochæte living in symbiosis with the *S. pallida*.

E. H. Ross[3] has studied the *development of the S. pallida*, and states that the spirochæte form is developed from large rounded bodies, found in large mononuclear cells, from the lymphatics. He compares these to " Kurloff's bodies," found in the large mononuclear leucocytes of guinea-pigs, and concludes that they are lymphocytozoa and parasites of the mononuclear leucocytes, and that they give rise to free-swimming spirochæte-like bodies. He suggests that the *Spirochæta pallida* has a similar development.

Diagnosis.—D'Arcy Power[4] points out that the *Wassermann test* is a laboratory test, and is open to the objection that we are " at the mercy of the pathologist." A more serious objection is the fallacy that it is an absolute proof of the presence or absence of spirochætes, because the test remains negative in a certain percentage of cases in every stage of syphilis. Boehm[5] also remarks that the reaction is only a confirmatory factor in the diagnosis of syphilis, and, like all other laboratory tests, must be taken in conjunction with the clinical findings in each case. Mulzer[6] regards it as useful in differential diagnosis, but of little value as regards prognosis and treatment. McDonagh, on the other hand, still looks upon it as a guide to treatment. Leroux and Labbé[7] consider it useful in diagnosis, provided it is performed in the same laboratory and by the same technique. Under these conditions, when repeated several times in the same individual, it is constant in 77 per cent of cases. A positive reaction, with known exceptions, almost certainly signifies syphilis, but a negative reaction does not exclude it. The results of serum diagnosis require to be interpreted, and should always be subservient to clinical

evidence. Treatment has no constant effect on the reaction, and the latter gives no certain therapeutic indication. Serum diagnosis gives no precise information as to cure or immunity.

Several observers have tried to produce a *cutaneous reaction* similar to von Pirquet's for tuberculosis, using an extract prepared from syphilitic tissues (*vide* MEDICAL ANNUAL, 1911), but Noguchi[8] has improved on this by using an extract of his pure culture of *Spirochæta pallida*, which he terms "luetin." This was prepared from several different strains of *S. pallida*, thus securing a polyvalent antigen. Noguchi remarks that the value of the luetin test awaits further investigation, but he considers it a specific test for syphilis, and its more constant presence in the later stages may be of special advantage as compared with the Wassermann test. He says that this anaphylactic condition of the skin in syphilis persists as long as the infecting agent survives in the body.

He distinguishes three *varieties of positive reaction*, according to the degree of intensity with which the skin of syphilitics responds to luetin: (1) A *papular* form, characterized by a large raised reddish indurated papule, from 5 to 10 mm. in diameter, which appears in twenty-four to forty-eight hours, increases in size for three or four days, and then begins to recede; (2) A *pustular* form, which begins like the papular but becomes pustular after the fourth day; (3) A *torpid* form, which is rare, in which the injection punctures fade in a few days, but after ten days become small pustules. In the majority of normal persons, luetin produces small red spots round the injections, which recede in forty-eight hours without any induration. This constitutes a negative reaction.

Gradwohl[9] has tried luetin in forty-four cases. He finds the test *negative* in primary syphilis, and sometimes in untreated secondary syphilis, latent cases, and parasyphilitic affections; *positive* in treated secondary cases, especially after injection of salvarsan, and positive in tertiary cases as a rule. The test is often positive when the Wassermann reaction is negative, and inversely. The Wassermann test is said to depend on the infectivity of the spirochæte, while the luetin test depends on the anaphylactic action of long-infected syphilitic tissues. Hence the luetin test will not be positive till the tissues have become sensitized after long infection. The disappearance of the luetin reaction may signify that the patient is cured, while the disappearance of the Wassermann reaction has no such significance. With regard to *technique*, the luetin should be kept in stoppered bottles and on ice. One part of luetin is mixed with two parts of sterile salt solution and injected into the left arm, while the control fluid, containing a suspension of the culture medium without spirochætes, is injected with another syringe into the right arm. The skin is prepared with sublimate-alcohol solution. The luetin is injected *intradermically*, not subcutaneously. Before using the luetin and control fluid they should be inoculated on culture tubes, to eliminate bacterial contamination. The author observed the three forms of positive reaction described

by Noguchi, but found that in the normal and control cases all trace of injection disappeared in three days, so that there appears no possibility of mistaking a negative for a positive reaction, provided the injection is made properly and the fluids are sterile. Gradwohl agrees with Noguchi in regarding the luetin reaction as an anaphylactic phenomenon and not of the nature of "Umstimmung," a name given by Neisser to the condition of the skin of syphilitics in which slight traumatism produces a more severe reaction than in normal individuals. He concludes that the luetin test will be useful in the diagnosis of tertiary syphilis and in deciding the question of cure, but of little use in the diagnosis of primary and secondary syphilis. Robinson[10] considers the luetin reaction specific for syphilis. He found it absent in non-syphilitic cases and in untreated primary and secondary cases, but sometimes positive in treated secondary cases; positive in all cases of tertiary, latent, and late heredo-syphilis, and more constant in these than the Wassermann reaction. Wolfsohn[11] and Kammerer[12] report results which agree on the whole with the above.

Treatment.—Neisser[13] remarks that general treatment should be as energetic as the patient can support, for the therapeutic action depends on the quantity of medicament introduced into the organism. Injections are preferable to inunction and internal medication, because they do less harm to the body. The true antisyphilitic drugs (which have the power of killing spirochætes) are **Mercury, Atoxyl, Arsenophenylglycin, Salvarsan,** and **Antimony.** Iodine and quinine are much less certain. As regards human syphilis, atoxyl is contraindicated on account of its action on the optic nerve. With regard to antimony, there is no evidence yet of its action in human syphilis, but it has a destructive action on the spirillosis of animals. Although both mercury and salvarsan may cure syphilis after energetic application, it is better to combine them. Such a combination has the following advantages: (1) While the dose of each drug is non-toxic, the combined effect is powerful; (2) Some spirochætes are affected more by mercury, and others more by arsenic; (3) Mercury and arsenic destroy spirochætes in different ways. By the addition of antimony, the combined treatment might be made still more powerful. Although it cannot be actually denied that Ehrlich's *therapia magna sterilisans* is possible, it is best to treat syphilis by a combination of drugs, some of which kill the spirochætes while others hinder their multiplication. In any case these drugs should be continued for a year or more. Cases of late syphilis, with or without tertiary symptoms but with positive reaction, require intensive treatment, because it is more difficult at this period to transform a positive into a negative reaction. This may be due to encapsulation or to sporulation of spirochætes, either of which would resist the action of drugs. Hence the idea of combining spirillicidal drugs with hydrotherapy, iodides, etc., with a view to breaking down the barriers which oppose the action of the drugs.

Neisser concludes with a *schema of treatment*: (1) Begin treatment as soon as possible; (2) Give several intravenous injections of **Salvarsan,** and several intramuscular injections of **Arsenophenylglycin;** (3) Combine this with **Grey Oil Mercurial Injections,** or **Asurol;** (4) Continue this treatment for at least a year.

Milian[14] recommends the following method: (1) Four intravenous injections of **Salvarsan** (0·3, 0·4, 0·5, 0·6 gram) during twenty days; (2) An interval of ten days; (3) Eight injections of **Grey Oil** or **Calomel** (0·07 gram), with eight injections of **Benzoate of Mercury** (0·02 to 0·04 gram), given alternately once a week, together with 3 grams of **Potassium Iodide** daily; (4) An interval of ten days; (5) Four injections of **Salvarsan** as before. As for a criterion of cure, Milian thinks that neither serum reaction nor clinical symptoms are certain, and advises a test reaction by an intravenous injection of 0·3 gram salvarsan, with subsequent serum tests at intervals. He concludes that the new arsenical preparations may succeed where mercury fails, because spirochætes which become resistant to one drug may be destroyed by another. But some cases may become refractory owing to the creation of arsenic-resistant spirochætes.

Finger[15] considers that syphilis may sometimes undergo spontaneous cure, but it is impossible to estimate the frequency of such an event. The graver evolution of the majority of cases makes it necessary to treat every case energetically, for statistics show that the severity of syphilis is inversely proportional to the energy of treatment. **Mercury** and **Iodides** have survived the test of time. **Salvarsan** is still in the experimental stage; it seems superior to mercury in certain cases, such as malignant syphilis, but it has a certain degree of toxicity due to arsenic. The results of *abortive treatment*, by excision of the chancre or by energetic local treatment, are variable. In some cases the symptoms disappear and the reaction becomes negative, but such cases are rare. In others, the symptoms recur and the reaction becomes again positive. Sometimes abortive treatment only postpones the secondary symptoms, in others it has no effect on the evolution of the disease. Some cases of syphilis are cured without treatment or with mild treatment, while others persist in spite of energetic treatment; hence, if "specific" drugs act only by increasing the power of resistance, it is possible that they may often fail to produce this result, and therefore the energy of treatment should be increased with caution.

Gaucher[16] considers that **Salvarsan** is indicated only in certain cases, chiefly those in which mercury has failed. It does not cure syphilis, but only heals syphilitic ulcerations. He does not believe that syphilis can be sterilized either by mercury or salvarsan. As for abortive treatment, he points out that more than a third of patients only present a chancre and a transient roseola which may escape notice even with no treatment, but these patients have tertiary syphilis after ten or twelve years. Hence, rapid cure of chancre and apparent absence of secondaries are no proof of abortive cure. He remarks,

" How can we say that syphilis is cured by ' 606 ' when we have only had about a year's experience ? " As to reported reinfections after salvarsan treatment, he regard these as chancre-form ulcerations due to the original infection. He does not look upon a negative Wassermann reaction as proof of cure, because the reaction may still be negative just before a fresh outbreak of symptoms.

He considers **Hectine** less active, but less dangerous, than salvarsan. According to Gaucher, salvarsan has no effect in parasyphilis, visceral syphilis, or leukoplakia. In his opinion, both the deaths and so-called " neuro-recurrences " after its use are due to arsenical poisoning. He has observed several cases of deafness and tinnitus after it, and one case of complete blindness due to optic neuritis. He concludes that salvarsan has caused more deaths than would have occurred if the disease had been left untreated. **Mercury** is, and should remain, the fundamental treatment for syphilis.

He recommends the following programme : (1) Daily injections of **Benzoate of Mercury,** 2 cgram, for a month ; (2) A month's rest ; (3) **Perchloride of Mercury Pills,** 1 cgram, twice a day during alternate months for two years ; (4) In the third year, pills during one month out of three ; (5) In the fourth year, pills during one month out of six. He also recommends the **Neutral Lactate of Mercury** for internal treatment—20 grams daily of a 1–1000 solution = 2 cgrams of lactate. He prescribes **Iodides,** 2 to 6 grams daily, at all periods of the disease when there are rebellious symptoms, and also for exuberant and phagedenic chancres, tubercular syphilides, visceral and nervous lesions. He considers four years' treatment necessary, even if the Wassermann reaction is negative, and an interval of five years' freedom from symptoms before marriage.

Salvarsan.—Queyrat[17] reports a year's experience based on 1003 injections in 511 patients, 635 intravenous and 368 intramuscular. For *intramuscular* injection he uses an oily excipient, consisting of eighty parts castor oil and twenty parts absolute alcohol. For *intravenous* injection, he dissolves the salvarsan in serum. Distilled water with eight per 1000 chloride of sodium, after addition of sufficient soda for alkalinization, most closely resembles blood serum. The temperature of the injected fluid should be 38° C. in winter, and 35° C. in summer, so as to reach the vein at a temperature of 30° C. The quantity injected is 250 c.c. during five to ten minutes. He begins with doses of 60 cgrams, and gradually increases the dose by 30, 40, and 50 cgrams. Three weekly intravenous injections are followed by a final intramuscular injection. *Contraindications* are advanced age, cachexia, severe diabetes, advanced tabes and general paralysis, old hemiplegia, and lesions of the heart, liver, and kidney.

His conclusions are : (1) In *tertiary* syphilis, ulcerations and gummata heal in ten to thirty days, but not more quickly than with mercury and iodide ; (2) In *secondary* syphilis, the lesions are improved but the disease is rarely cured ; mucous patches heal quickly, but papular syphilides are resistant ; in secondary syphilis, salvarsan is locally

curative, but mercury should be the fundamental treatment; (3) In *primary* syphilis, out of seventy-eight patients treated within a month after the appearance of the chancre, fifty-one had no secondary symptoms during one to six months. The results were good in syphilitic iritis and neuroretinitis, but *nil* in alopecia, leukoplakia, and ozæna. No case of optic neuritis was observed after salvarsan, but one death occurred in a healthy man six hours after an injection of 60 cgrams, from acute nephritis.

Nicolas and Moutot[18] report on 352 injections in 162 patients, twelve of whom were non-syphilitic. Most of the injections were intravenous, with an alkaline solution. The results are as follows: In *primary* syphilis, chancres healed in twenty to twenty-five days, but there was little effect on the glands, even after several injections. In *secondary* syphilis, the effect was rapid on the roseola, the miliary syphilide, condylomata, and mucous patches, osteoperiostitis, and headache, and especially rapid on ulcerative syphilides, including malignant syphilis; but in two cases of malignant syphilis there was no good result. The effect was slower on large papular syphilides and on iritis, and *nil* on the pigmentary syphilides. In *tertiary* syphilis, a gumma of the leg healed in a month after two injections, but in two other similar cases there was no improvement, and one of these healed under mercury and iodide. The results were better in gummatous infiltration of the nose, pharynx, and tongue. In *parasyphilis*, there was temporary improvement of the gastric crises in two cases of early tabes, but as a rule there was no effect on tabes or general paralysis. In *leukoplakia*, there was no effect, even after several injections. In *hereditary syphilis*, there was no effect on a case of osteomyelitis with ulceration of the skin, nor in a case of Parrot's nodes in a child of eighteen months, who died a month after the injection. The authors remark that while salvarsan acts rapidly in some cases, it is certain that in most cases the same effects can be produced with mercury and iodide; also, that while some cases which resisted mercury were healed by salvarsan, the inverse occurred in two cases.

The *contraindications* are advanced age, nervous disorders with bulbar symptoms, circulatory disease, ocular lesions, diabetes, nephritis, tuberculosis, and cachectic states; but these are not absolute. The *indications* for salvarsan, according to these observers, are: (1) An attempt to abort syphilis by a series of injections of 40 to 60 cgrams commenced before the glands are enlarged; (2) Lesions rebellious to mercury, which are rare if mercury is used in various ways and in large doses, but include recurrent ulceration of the throat and lichenoid syphilides; (3) Cases where mercury is not tolerated, or causes albuminuria; (4) Malignant syphilis; (5) Cases where rapid action is required, either on account of the gravity of the lesion or for prophylaxis. These observers had three deaths, none of which was attributed to the drug: one died from pulmonary tuberculosis, another from epithelioma, and the third was an infant in whom the injection was found encysted. Out of 318 intravenous injections, 122 were followed

by no reaction, but in the remaining 196 the reaction was manifested by some of the following symptoms: headache, rise of temperature, vomiting, diarrhœa, epigastric pain, retention of urine, rigors, cutaneous eruptions (scarlatiniform, rubeoliform, vesiculobullous, herpetic and purpuric). In one case, a young subject, unilateral optic neuritis with complete blindness followed a month after the third injection of 60 cgrams.

The authors sum up as follows: (1) Intravenous injection is the best method, intramuscular and subcutaneous injection being liable to pain, abscess, and necrosis; (2) Salvarsan has a rapid resolutive and cicatrizing action on all the active manifestations of syphilis; (3) The preventive action is very slight. In early syphilis, relapses are frequent, even after three or four injections of 60 cgrams; (4) Salvarsan may certainly be dangerous, even when injected with the best technique and apart from contraindications. Numerous deaths have been published, and accidents are common and often severe; (5) The feeble preventive action and the possibility of accidents should limit its use to the indications mentioned above; (6) The dose should always be moderate—30 to 40 cgrams, exceptionally 40 to 60 cgrams, but in attempts at abortive treatment a series of doses of 40 to 60 cgrams may be given; (7) In no case can we regard the patient as cured; prolonged mercurial treatment should always be given after salvarsan. In the present conditions, salvarsan can neither replace nor exclude mercury in the treatment of syphilis; it must be reserved for special cases, and even then should be associated with mercury.

D'Arcy Power[19] considers that salvarsan is an excellent adjuvant to mercury, but that it should not be used by itself nor in place of mercury. He has found it useful in chronic superficial glossitis, ulcerating syphilides, and syphilitic periostitis. He does not think that syphilitic lesions are more completely cured by salvarsan than by mercury, but that the action of salvarsan is more rapid. Until we have had more experience of its action for several years, we are not justified in saying that salvarsan cures syphilis.

Major Gibbard[20] considers salvarsan superior to mercury in the treatment of syphilis, and mentions five cases of reinfection after salvarsan treatment as proof of the efficacy of this drug. Nevertheless, he says that the best results obtained at the Military Hospital were by following up salvarsan treatment by nine weekly injections of mercurial cream. [With regard to "reinfections" after salvarsan treatment, it is more than possible, as Gaucher has pointed out, that some of these, at any rate, are fresh outbreaks of the original disease in the form of chancriform ulcerations, and not true reinfections.—C. F. M.]

Morris[21] reports a case of late syphilitic glossitis which rapidly improved with a single dose of salvarsan, after mercury had failed. At the same time some chronic syphilides of the scrotum and perineum, etc., also healed. The patient was then given small doses of mercury

internally. This observer says he knows of no combination of remedies which would have produced such a rapid result ; nevertheless, he does not regard salvarsan as an infallible specific to be employed promiscuously in syphilis. He therefore recommends supplementary mercurial treatment.

Allport[22] reports a case of chronic superficial glossitis with fissures, ulceration, and a hypertrophic patch suggesting epithelioma, in which the *local application* of salvarsan caused great improvement. The application used was 0·1 gram of salvarsan dissolved in ½ dr. of water and added to 1 oz. of glycerin, applied to the tongue every hour for ten hours, for several days, with intervals of three, four, and seven days, a fresh solution being used each day. After three weeks' treatment, all the ulcers were healed, and the fissures had partly disappeared, but some induration remained.

Toxic Effects of Salvarsan.—Ehrlich[23] attributes the apparent toxic effects following injection of salvarsan, both immediate and remote, to the setting free of endotoxins by the destruction of large quantities of spirochætes by the drug. Finger,[24] Gaucher,[25] and others consider them due to arsenical intoxication, and Finger points out that similar symptoms are produced after injection of salvarsan in non-syphilitic cases, such as psoriasis and leprosy. Wechselmann suggests that some of the immediate symptoms are due to the presence of microbes in the saline solution used for injection.

Salvarsan appears to have a toxic effect on the nervous system and kidneys. Affections of the *cranial nerves,* chiefly the motor oculi and auditory, resulting in ocular paralysis, tinnitus, vertigo, and deafness, have been noted by Finger, Stern,[26] and others. Some attribute these to the disease and not the drug, others to the neurotoxic action of the drug. Ehrlich considers that affections of the cranial nerves are due to the survival of spirochætes in the bony canals, after all the other spirochætes have been destroyed by salvarsan ; but Finger found that in several of his cases there were co-existent lesions of the skin and mucous membranes, showing that the spirochætes were not all killed. He also draws attention to the frequency of nerve lesions after salvarsan, as compared with their infrequency after mercury. Gaucher reports several cases of toxic effects occurring both after salvarsan and neo-salvarsan. These include two cases of unilateral deafness occurring three months after three injections of salvarsan, which did not yield to calomel injections ; also, a case of optic neuritis, a sequel from which salvarsan was said to be especially free. Other cases of optic neuritis after salvarsan have been reported by Cohen,[27] Nicolas, and Moutot.[28]

Gaucher also reports two accidents after neo-salvarsan : a fatal case in a young woman, five months pregnant, who died two days after a second injection of neo-salvarsan (0·6 gram) ; and a case of paraplegia occurring four days after an injection of neo-salvarsan in a girl with hereditary syphilis. Both these accidents are attributed to the toxic effects of arsenic.

Affections of the *kidney* include albuminuria, hæmaturia, the passage of granular and hyaline casts, hæmorrhagic nephritis with albuminuric retinitis, uræmic convulsions, coma, and death. Different interpretations of these effects are given by different observers; some say that there must have been antecedent renal disease, but fatalities apparently due to acute arsenical nephritis have been reported by Gaucher and others. Buschke[29] thinks it possible that microscopic foci of necrosis may be produced by deposits of salvarsan in the internal organs, in the same way as deposits of the drug after intramuscular injection sometimes cause necrosis of the glutei muscles, and that these foci of necrosis may predispose to further manifestations of visceral syphilis.

Benario[30] has published a monograph on the *nerve complications* following both salvarsan and mercury, as a counterblast to the observations of Finger; but his conclusions are based on erroneous data. For instance, he says that while Finger had 9 per cent of nervous complications in 500 cases, Wechselmann only had 0·37 per cent in 2800 cases, but he omits to say that 75 per cent of Finger's cases were carefully followed up, while very few of Wechselmann's were kept under observation. Wechselmann himself admits this in his book on the treatment of syphilis by salvarsan.

Deaths after Salvarsan.—The total number of deaths is not known, because all have not been reported. Leredde[31] collected and analysed fifty-four cases of death in adults observed on the Continent, but these do not include American and English cases, nor deaths in infants. The total number of deaths now probably exceeds 100. Leredde considers that with few exceptions the deaths were due to faults in technique, non-observance of the contraindications, and injection in hopeless cases, such as advanced tabes and general paralysis, cerebral syphilis, and aortic disease. However, several deaths in robust subjects have been reported by Gaucher,[32] Hirsch,[33] and others, which were probably due to arsenical poisoning. Balzer and Godlewski[34] state that salvarsan is unstable, and may become oxidized by contact with air and decomposed in the blood with the formation of arseniate of sodium, and that this may account for its toxic effects. Balzer[35] reports a fatal case of meningo-encephalitis after two intravenous injections of salvarsan (30 cgrams, with an interval of a week) in a patient with secondary syphilis. Arsenic was found in the blood, urine, and cerebrospinal fluid. Leredde gives another explanation of some of the accidents due to salvarsan, namely, the Jarish-Hertheimer reaction, which manifests itself in the first days of treatment by an increase in all the symptoms—a reaction analogous to that of tuberculin. According to Leredde, this reaction, which is seen after mercury, is more pronounced after salvarsan, hence the "neurotoxic" effects, or "neuro-recurrences," are only reactions at the site of pre-existing syphilitic foci.

For further data regarding salvarsan, *see page* 35; *see also* **Joha**, *page* 20.

Neosalvarsan is a condensation product of formaldehyde sulphoxylate of sodium and salvarsan. Schreiber[36] has given 1200 injections to 230 patients, some intravenous and some intramuscular. The dose was 1·5 gram for men, and 1·2 gram for women. The therapeutic effect is said to be the same as that of salvarsan, but the "undesirable effects" less. The latter advantage is attributed to the neutral reaction which allows intramuscular injections to be given; but Schreiber prefers intravenous. McDonagh[37] says that neosalvarsan acts in some cases where salvarsan fails, and that it has a greater effect in transforming a positive Wassermann reaction into a negative. On the other hand, Wolff and Mulzer[38] state that neo-salvarsan is much less specific than salvarsan, and is also very toxic. Kall and Gennerich[39] also prefer the old salvarsan. Two accidents with it have already been reported by Gaucher (*vide supra*). (*See also page* 25.)

Experimental Syphilology.—Neisser[40] remarks that it is experimentally proved that the spirochætes have generally spread in the body before the chancre is clinically appreciable. Experimental research has shown that in diseases caused by trypanosomes and spirochætes, cure is more likely the earlier treatment is begun. This applies to syphilis.

There is no proof of immunity after apparent cure of syphilis; reinfection may take place in animals and man, and the second attack may follow the same course as the first. On the other hand, in the first years of infection, there is a high degree of resistance of the skin to further infection, but this may be overcome by inoculation with material rich in spirochætes (superinfection). Before syphilis has become generalized, inoculation with autogenous or heterogenous virus may produce new chancres. Later on, inoculation may also give positive results when made in a region which has not been influenced constitutionally. Thus, superinfection occurs only under certain conditions; tissues not yet infected react like primary infection; tissues affected with secondary, tertiary, or malignant syphilis present corresponding products of superinfection. But in the late tertiary period, the products of inoculation may closely resemble primary chancres; this may be due to return of the normal reactive power of the tissues.

As regards **Serum Therapy,** no method of passive or active immunization has yet been discovered, but it is possible that immunization may be attained by means of pure cultures of spirochætes. Serum diagnosis is essential to treatment, because the clinical symptoms do not give enough evidence. A positive reaction is proof of infection; a negative reaction, although of less value, gives important information as to diagnosis and treatment. Serum diagnosis has shown that the treatment of syphilis has hitherto been generally insufficient. This accounts for the frequency of post-syphilitic affections, and also for the rarity of reinfection.

Finger[41] remarks that recent research has shown that the virulence

of the syphilitic virus is generally constant, and that variations in the evolution of the disease are due to differences in the soil. All attempts to attenuate the virus have failed, and also attempts at vaccination. The old theory of immunization must be abandoned.

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SYPHILIS, CARDIAC. (*See* CARDIAC SYPHILIS.)

SYPHILIS, CONGENITAL. *C. F. Marshall, M.D.*

DIAGNOSIS.—Leroux and Labbé,[1] as a result of their researches in the serum diagnosis of heredo-syphilis and family syphilis, obtained a positive reaction in nearly all cases of early congenital syphilis with active symptoms; in 85 per cent of cases of late heredo-syphilis, but in only 11 per cent of latent cases (generally after treatment). Healthy children born of syphilitic parents all gave a negative reaction. In heredo-parasyphilis (dystrophies and degenerations), the reaction was also negative. The reaction was positive in 71 per cent of mothers of syphilitic children, whether they had symptoms of syphilis or not. The fathers of syphilitic children gave a positive reaction in 42 per cent.

The authors conclude that: (1) Maternal syphilis is more often latent without symptoms, and more often virulent because unrecognized and untreated; (2) Maternal syphilis is more often conceptional than acquired directly from the father; (3) The frequency of conceptional syphilis explains Colles's law, because the mother is already infected; (4) The number of cases of purely paternal transmission is small, because in most cases the mother is also infected; (5) Active maternal syphilis with a positive reaction generally gives rise to virulent infantile syphilis, sometimes to latent syphilis without symptoms but with a positive reaction, more rarely to infantile syphilis with a negative reaction, occasionally to healthy children; (6) Latent maternal syphilis with a negative reaction nearly always gives rise to parasyphilis or to healthy children, occasionally to syphilitic children

with a positive reaction with or without symptoms; (7) Paternal syphilis (the mother being apparently healthy and with a negative reaction) only gives rise to parasyphilis with a negative reaction, or to healthy children; (8) A father with active syphilis and a positive reaction never procreates a syphilitic infant with a positive reaction without the mother being infected.

H. R. Dean[2] has applied the Wassermann test to estimate the frequency of congenital syphilis as a cause of idiocy. He examined 330 idiots, and found a positive reaction in 15·4 per cent, a figure far higher than that given by Shuttleworth and others as the result of clinical observation.

TREATMENT.—Jeanselme[3] treated a case of congenital syphilis in an infant of five weeks, with milk from a goat injected with salvarsan. Seven injections were given to the goat in the jugular vein, 30 cgram for the first and 40 cgram for the other injections. The symptoms in the child improved slowly for a time, but then remained stationary, necessitating mercurial treatment. No trace of arsenic was found in the milk, so that the temporary improvement was probably due to the goat's milk, which was long ago recommended for congenital syphilis by Fournier.

REFERENCES.—[1]*Arch. de Méd. des Enf.* 1911, Dec.; [2]*Brit. Jour. Child. Dis.* 1912, Sep.; [3]*Paris Méd.* 1912, No. 1.

Frederick Langmead, M.D., M.R.C.P.

Hahn[1] records three cases of *nephritis in newly-born infants*, due to inherited syphilis; all ended fatally. The nephritis was pronouncedly hæmorrhagic in type. Œdema occurred in all. The urine contained waxy and epithelial casts in a state of marked fatty degeneration, with much blood and albumin. Anuria occurred in one case, but uræmic symptoms were not observed. In two cases the kidneys were recognized as definitely enlarged during life. As Hahn points out, the condition corresponds to that ascribed to inherited syphilis in older children; the detection of enlargement of the kidneys being, however, peculiar to his cases. This, however, cannot be relied upon as a help in diagnosis.

Another form of visceral syphilis, still more seldom recognized, is that which affects the *heart*. Myocarditis, however, has been found in syphilitic fœtuses (Wagner), and has been demonstrated in the heart of an infant aged six weeks by Hektoen. Gummata, too, have been seen occasionally. Warthin and Snyder[2] record two cases of *syphilitic myocarditis*, one in an infant two months and twenty days old, the other in an infant eight days old. No other viscus was affected. Spirochætæ were demonstrated in the heart muscle, to which site they were confined. In the first case, small translucent nodules were found beneath the epicardium and throughout the cardiac muscle; in the second, the walls were greatly hypertrophied, the muscle being much paler than normal, and similar translucent nodules occurred, some of which extended through the heart wall from epicardium to endocardium, projecting on both surfaces. Micro-

scopically, the muscle showed a pale degeneration of the muscle fibres, epithelioid proliferation of the stroma, cellular infiltration, and fatty degeneration, changes regarded as characteristic by the authors.

Rosenberg[3] has observed a series of cases of *severe jaundice* in syphilitic infants. In one, the cause was shown to be a gummatous peripylephlebitis, the main bile-channels being blocked at the portal fissure by a gumma. A second case, which was cured by anti-syphilitic treatment, he ascribed to gummatous cholangitis. In a third, severe jaundice occurred during the eruption of the rash, and parenchymatous degeneration of the liver cells was found without noticeable interstitial changes. In the fourth, the jaundice also accompanied a syphilitic rash, and was due to a rapid and severe interstitial hepatitis. In two others, jaundice and skin eruption coincided, but the condition was complicated by simultaneous infections.

TREATMENT.—During the last year, **Salvarsan** has had a more extended trial. E. Welde[4] gives results in twenty-eight cases. At first he administered it by subcutaneous and intramuscular injections, but as these caused painful infiltrations, he abandoned them in favour of the intravenous method, which he finds not always easy. The average dose was 0·1 gram, and in some cases two or three injections were given. The general condition improved, and lesions of the skin and mucous membrane healed quickly, but visceral affections, such as enlargement of the spleen, liver, or glands, were diminished only occasionally. The Wassermann reaction became negative in only one case, and even in that became positive again. No ill effects could be attributed to the drug, but five infants died a few weeks later from intercurrent affections. The author concludes that the effects were no better than can be obtained by mercury and iodides.

Somewhat better results are recorded by Acuña and Schweizer,[5] who used neutral intramuscular injections in seven cases. The ages ranged from thirty-three days to eight months, and the dose varied from 5 to 8 mgrams per kilo. of the body-weight. One case developed a local abscess at the site of the injection. In all, the drug exercised a rapid action on the skin eruption. Contrary to the experience of Welde, the enlarged liver soon resumed its normal size, but the spleen diminished more slowly. Wassermann's reaction, positive in the cerebrospinal fluid before treatment, became negative afterwards.

Others have employed the *indirect method*, injecting the mother with salvarsan in order to influence her baby through the breast milk. E. Jeanselme[6] has collected twelve cases from the literature, and observed four others. In six the treatment was successful, in ten unsuccessful. He concludes that though the method sometimes causes a rapid disappearance of the superficial lesions, a recurrence of these not infrequently follows. On the visceral lesions it appeared to be inert. It may even aggravate the disease, and cause the death of the child. **Mercury** in the form of inunctions may keep in check lesions which have resisted salvarsan. Wolbarst,[7] having injected a mother with 0·5 gram of salvarsan, could find only one part of arsenic

in ten million of the mother's milk. Her syphilitic baby died. Chapin[8] records another unsuccessful case, though the lesions improved before the baby died. An intramuscular injection of 0·4 gram of salvarsan was given to the mother, but no arsenic was found in her milk.

Jesionek,[9] on the other hand, found that the milk of women injected with salvarsan contained an appreciable amount of arsenic, and that the milk of a goat similarly treated yielded arsenic within twenty-four hours of injection. He treated two cases of inherited syphilis by injecting the mothers with salvarsan, but both were unsuccessful, one child becoming seriously ill. These bad results he attributes to endotoxins, which had been either introduced by the mother's milk, or generated in the child itself by the drug. He also records a more satisfactory result in a child of five with acquired syphilis, treated by the administration of "**Salvarsan Milk**"—milk from a goat previously injected with 40 cgrams salvarsan. Jeanselme, Vernes, and Bertrand,[10] on the other hand, were unsuccessful with salvarsan milk in a case of inherited syphilis, and were unable to find any trace of arsenic in the milk.

It appears from these observations that salvarsan is uncertain in its action and certainly not free from danger. There is considerable doubt whether salvarsan milk, whether from the goat or the mother, contains arsenic, and in any case its effects are equally uncertain and sometimes dangerous. In a word, **Mercury** is still the only satisfactory treatment of inherited syphilis.

REFERENCES.—[1]*Deut. med. Woch.* 1912, 759; [2]*Jour. Amer. Med. Assoc.* 1912, i, 689; [3]*Deut. med. Woch.* 1912, 756; [4]*Jahrb. f. Kinderheilk.* 1911, lxxiv, 322 (*Brit. Jour. Child. Dis.* 1912, 181); [5]*Rev. Soc. Méd.* 1911, xix, 622 (*Brit. Jour. Child. Dis.* 1912, 182); [6]*Ann. de Gyn. et d'Obst.* 1911, viii, 394 (*Brit. Jour. Child. Dis.* 1912, 183); [7]*Amer. Med.* 1911, 486; [8]*Amer. Jour. Obst.* 1911, lxiii, 335; [9]*Münch. med. Woch.* 1911, 1169; [10]*Paris Méd.* 1911–12, i, 86.

SYRINGOMYELIA.

(*Vol.* 1912, *p.* 75)—Improvement in symptoms is said to follow systematic exposure to **X-Rays.**

TABES DORSALIS. (*See also* SPINAL CORD, SURGERY OF; *and* SYPHILIS.)

(*Vol.* 1912, *pp.* 2, 49, 502)—**Adalin** has been found serviceable in the relief of girdle pain. Obstinate cases of gastric crisis have been benefited by **Resection of Posterior Roots.** Opinion is divided as to the value of **Salvarsan**; some find it useful in early cases, while others think it aggravates the disease.

TALIPES.

(*Vol.* 1912, *p.* 260)—Both in the congenital and the acquired forms, **Elastic Traction** is widely applicable.

TELEGRAPHIST'S CRAMP. *Purves Stewart, M.D., F.R.C.P.*

This variety of occupation neurosis is perhaps the next in importance after writer's cramp. As in the other occupation neuroses, telegraphist's cramp does not develop when the telegraphist is learning his work, but only after a number of years of constant practice, when he is expert and dependent on it for his livelihood.

The disease was originally described in 1875 by Onimus[1] in Belgium He gave a clear account of the symptoms, and associated the complaint with the use of the Morse key. Later publications by Robinson[2] in 1882, by Fulton[3] in 1884, and an extensive monograph by Cronbach[4] in 1903, have also appeared. The latest authoritative account is by Thompson and Sinclair,[5] who were appointed as a medical sub-committee by the British Postmaster-General, and from whose article the following points are extracted.

Etiology.—Any instrument which calls for repeated fine muscular movements of the same kind may induce an occupation neurosis. Telegraphist's cramp is specially associated with the manipulation of the Morse key, as in all of the seventeen cases examined by Thompson and Sinclair. The manipulation of other instruments, such as the Baudot or Hughes key-boards, may also induce the malady, although with less frequency. The pain and spasm occur only during use of that particular instrument on which the disabled worker has been employed, so that disability in the use of the Morse instrument does not necessarily imply disability in the use of the other instruments.

The length of service before such cramp occurred in workers with the Morse instrument varied from twenty-eight to six years, the average being about sixteen years. An important point was the ability of the subjects of Morse cramp to perform other actions besides Morse manipulation, and to use other instruments than the Morse. If, however, the operator persisted in working for long periods after the development of Morse cramp, cramp might also occur with the Hughes instrument.

A circular was sent to each of 8,153 telegraphists employed in Government service, inquiring as to the presence of symptoms. Out of 7,317 telegraphists who replied, 98 complained of some difficulty in keying. Thirteen of these cases were found to be affected with the malady. Nevertheless, over one-third of the staff professed to feel more or less difficulty in manipulation, but it is probable that in most cases this was due to real fatigue, and not to true telegraphist's cramp. All the cases which complained of symptoms were those of operators with the Morse key. Out of 105 telegraphists employed in the cable room of the central telegraph office, where the Hughes and Baudot instruments are mainly used, no case of true cramp occurred. This indicates that in England, at least, the malady is chiefly associated with the Morse key. This is probably due in some measure to the fact that the Morse key is the prevailing instrument, but it is also partly due to the monotonous and unvarying movements necessitated by this particular instrument. In female telegraphists the malady occurs at an earlier period of service than in males.

Symptoms.—Before any cramp or spasm is apparent, there is usually a stage characterized by subjective symptoms only, consisting of pain or discomfort in the operating hand and arm. The pain is referred to various parts of the limb, but it is constant in its time of appearance, i.e., it occurs as soon as the operator begins to operate the key, before

any true muscular fatigue is possible. This is the diagnostic point which distinguishes it from pain caused by fatigue.

The phase of cramp, i.e., involuntary, violent, and painful contraction of the muscles, with visible spasm, although regarded as the special mark of the disease, is really its later stage. When actual spasm occurs, there is impairment of co-ordination and difficulty in carrying out the specific fine movements required.

The symptoms in a case of true cramp consist in pain, aching, and stiffness in the operating arm, variable in position but constant in their time of appearance, viz., as soon as, or shortly after, the operator begins to key, before true muscular fatigue is possible. If these symptoms are neglected and work at the Morse key be persisted in, there develop motor inco-ordination and difficulty in signalling some particular letter or letters. As a result the speed of signalling becomes greatly reduced. In many cases cramp is confined to the right hand, the telegraphist remaining able for months or years to use the left hand, but eventually even this may become affected. The pain or spasm does not disappear if the work of the right hand is persisted in.

The Morse instrument consists essentially of a lever moving on a hinge fulcrum. The proximal arm of the lever is surmounted by a knob, kept elevated by a spring which depresses the distal arm. The manipulation consists in a series of depressions of the proximal arm against the resistance of the spring. The range of movement of the key varies from $\frac{1}{12}$ to $\frac{1}{3}$ of an inch. The resistance of the spring varies from 2 to 4 ounces. The knob is loosely grasped by the right thumb and the index and middle fingers, and the key is alternately depressed and elevated by fine flexion and extension movements, chiefly at the wrist. The rapidity of movement is considerable, and it has been estimated that a telegraphist on this instrument makes more than twice as many movements per minute as a typist.

The real cause of telegraphist's cramp is a weakening or break-down in the central controlling mechanism in the brain, resulting in spasm and inco-ordination of muscles when performing the specific act of telegraphing. The muscles themselves are perfectly healthy, and can be used for other actions without pain or cramp. The pain experienced by the cramp subject is probably the result of the irregular strain resulting from the muscular inco-ordination. The breakdown is therefore essentially central in origin, not due to mere muscular fatigue. It may be aggravated by neurasthenia, alcoholism, or other causes of ill-health, or by local causes, e.g., brachial neuritis, rheumatic or gouty affections of the muscles or tendons, accidents to the arm, a bad style of manipulation, want of practice, etc. Mechanical faults in keys—bad adjustment of the amount of play in the signalling lever, and of the spring-tension—faulty arrangements of seats and tables, insufficiency of space, faulty positions of keys on table, may all aggravate the malady.

Prevention.—Thompson and Sinclair make the following suggestions :—

Careful selection of the staff on appointment, and a thorough examination by a medical officer and a telegraphic expert during the probationary period. This examination should be specially directed to the exclusion of learners with temperamental or physical unfitness. A previous knowledge of typing is to be recommended as some indication of an aptitude for telegraphic work. Ambidexterity of learners should be encouraged. Improvements may be made in the method of tuition and in the organisation of the teaching in schools.

As to the *organisation of general work*, they recommend limitation of the hours of Morse sending, alternation of instruments, encouragement of the staff to report symptoms of difficulty in sending as soon as possible, and attention to general health. For the *improvement of instruments and apparatus*, they propose regular adjustment of instruments by skilled officers, standardisation of the range of spring-resistance in the keys, and correction of faulty arrangements in desks and chairs.

The nervous breakdown known as telegraphist's cramp is the result of two factors—nervous instability of the operator, and the occurrence of repeated fatigue during the complicated muscular movements required for Morse sending. This fatigue is relative to the nervous state of the operator and not to the amount of work performed. If the conditions which lead to fatigue, and are above enumerated, can be remedied, the personal factor alone remains as a cause of cramp, and this can only be eliminated by a careful and judicious selection of the staff.

References.—[1]*Gaz. Méd. de Paris*, 1875, 175; [2]*Brit. Med. Jour.* 1882, Nov. 4; [3]*Edin. Clin. and Path. Jour.* 1884; [4]*Arch. f. Psych.* 1903, 243; [5]*Lancet*, 1912, i, 888, 941, and 1008.

TENOSYNOVITIS.

Fibrolysin used in treatment (*page* 14).

TESTIS, INFLAMMATION OF. (*See* Epididymitis.)

TESTIS, MALIGNANT DISEASE OF. *Priestley Leech, M.D., F.R.C.S.*

(*See also* Medical Annual, 1911, for operative details.)

Morriston Davies[1] classifies the tumours of the testicle as follows:—

Embryoma: Solid; cystic (dermoids).

Carcinoma: Encephaloid (alveolar, non-alveolar); scirrhus.

Sarcoma: Round-celled (lympho-sarcoma).

Endothelioma: Lymph-endothelioma; hæm-endothelioma.

With the rare exceptions of fibroma and adenoma, all neoplasms of the testicle are more or less malignant.

Diagnosis.—Unless the scrotum is affected, there is no involvement of the inguinal glands until a late stage, when the gland in the posterior triangle of the neck may be affected. The lymphatics of the testicle run to the glands around the aorta and vena cava, and therefore the upper part of the abdomen must be examined. Exceptionally, an embryoma may fail to develop malignant characteristics for many

years, and the length of the history, even if the tumour date from early childhood, must not be taken as against malignant disease; indeed, it should suggest malignant disease if there has been any increase in the size of the testicle (apart from hydrocele), or if the tumour has become painful. If these changes follow an injury, and tapping shows a blood-stained fluid, the swelling may be wrongly diagnosed as a hæmatoma.

Hydrocele is often present, and may be unilocular or bilocular, and limited to one or other pole; it may envelop the gland and thus mask its enlargement (*see Plate XXXVI*). When part or the whole of the tumour has degenerated, there may be softened areas; if wholly or mainly broken down, it presents the appearance of a cyst. If to this be added some thickening posteriorly, it may then resemble a tuberculous testis. Syphilis produces a lobulated tumour with areas of softening; but the lobulation is more pronounced, the softening due to degeneration of a gumma is more precisely confined to one or more lobules, while the softened areas, unlike those of malignant disease, become adherent to the overlying scrotum. The patient may first see the surgeon on account of abdominal symptoms due to enlargement of the lumbar glands.

Treatment.—Davies thinks the radical operation should be performed, and that the extra-peritoneal route is the better one. If the diagnosis is uncertain, the tumour should be explored: if syphilitic, no harm is done; if tuberculous or a hæmatoma, operation is the best treatment. Morris[2] describes the cases of two patients whose lives were prolonged for years after operation. This gives hope that the "radical" method of excision may prove successful, although reports of seventeen cases so treated lend little support to this hope. Bland Sutton[3] says complete removal of lymphatic areas within the abdomen is impracticable.

References.—[1]*Lancet*, 1912, i, 418; [2]*Ibid.* 635; [3]*Ibid.* 666.

TESTIS, TUBERCULOSIS OF. (*See* Epididymitis.)

TETANY IN CHILDREN. *Frederick Langmead, M.D., M.R.C.P.*

Etiology.—It is generally agreed that infantile tetany is much commoner in rickety babies and in those who have been artificially fed. A certain type of infant has been termed "spasmophilic" by Koplik[1] and other Americans. Often such children are born of neurotic parents; they are nervous, excitable, and have a pasty complexion. Rickets, craniotabes, and later slight hypertrophy of the lymphatic structures, are noticed. In them the smallest variation in daily routine or in diet produces disturbance, and they are likely at any time to show the signs of frank tetany. According to von Pirquet, fully 56 per cent of all children come into this class. [Such a description, craniotabes excepted, is true of a large number of artificially-fed infants, but actual tetany is comparatively uncommon in England.—F L.]

Since the work of Gley and Vassalé, who showed that tetany can be

PLATE XXXVI.

EMBRYOMA OF THE TESTIS, WITH HYDROCELE

Bristol General Hospital, No. 5607

Photograph, Geo. Scott Williamson, Pathologist

produced experimentally by ablation of the parathyroid glands, much attention has been paid to the post-mortem appearances of those organs in fatal cases, but very contradictory results have been recorded. MacCallum and Voegtlin came to the conclusion that in some way the parathyroids influence calcium metabolism, and that their inefficiency or removal allows a leakage of calcium from the body, and consequent hyperexcitability of nervous tissue. Forsyth, however, after a careful study of the possible relationship of the thyroid and parathyroid glands, comes to the conclusion that the parathyroids are merely accessory thyroids and have no function apart from that of the thyroid gland. Tetany, as the result of the extirpation of this gland, has long been recognized.

Fig. 102.—TETANY. A case of the writer's showing the dilatation of the colon.

Some believe that *a specific infection* is a *sine qua non*. The endemic incidence of tetany in certain localities, as in Vienna and Heidelberg, and its regularly increased prevalence during the first four months of the year, especially in March and April, support this view. Epidemics may occur, and tetany may simultaneously affect several members of the same family.

The view that tetany is due to the influence of internally generated *toxins* is steadily gaining support. Thus Bouveret and Dèvic isolated a product from the stomach contents in three cases of gastric dilatation and tetany, which, when injected into animals, provoked the clinical picture of tetany. A possible source of the poison is the intestine. In nearly every case of tetany in infants, the symptoms are preceded by diarrhœa or other change in the motions.

The writer[2] has recorded a group of cases in which intractable and relapsing tetany was associated with *dilatation of the colon* (*Fig.* 102)

and unhealthy and offensive motions. The tetany affected children past the usual age, and was very chronic and liable to relapse, sometimes lasting for years. It depended upon the state of the motions rather than upon the amount of dilatation, and was almost certainly due to absorption of toxins from the stagnant contents of the dilated colon, since other evidences of toxæmia, such as œdema and albuminuria, were occasionally present; fever was the rule, and relief was obtained by washing out the colon.

No constant changes have been found in the *nervous system* in tetany. Recently J. Zappert[3] has examined six cases of this disease, and found no lesion, either in the cords or spinal ganglia, which could be looked upon as characteristic.

Symptoms.—The most distinctive feature is the position of the extremities. The hands are held in the "accoucheur" position, the fingers being drawn together into a cone, the thumb adducted and firmly opposed to them or projecting between the first and second, or second and third fingers. The toes are similarly drawn together and the foot is pointed downwards. The wrists, elbows, and knees are flexed. (This position is well shown in *Plate XXXVII.*) Œdema appears on the dorsa of the hands and feet in severe cases. Chvöstek's sign, or facial irritability, is usually present. It is elicited by lightly tapping the cheek over the facial nerve, when the facial muscles on the same side, including the orbicularis palpebrarum, immediately contract (*Plate XXXVIII*). If a limb has recently been in the position of tetany, it can be caused to reassume that position by firmly compressing or encircling its upper part—upper arm or thigh respectively (Trousseau's sign). There is an increase of galvanic irritability, and the anodic closure contraction becomes greater than the kathodic. Rarely, the spasm is not confined to the limbs, but affects the trunk muscles also, including those of the jaw, causing trismus. Laryngismus stridulus is very commonly present. The motions are usually loose and offensive, greenish in colour, and often containing mucus. To these well-known symptoms Ibrahim[4] has added some referable to tetany of the sphincters, involuntary muscles, and heart. He has observed two cases which commenced with spasm of the sphincter vesicæ and severe retention of urine. Finkelstein has noted tachycardia, and Ibrahim points out that sudden death occurs not infrequently. This he thinks is due to heart stasis. The condition of the pupils often suggests that tetany of the involuntary muscles may exist.

Koplik states that usually the first symptom is spasm of the larynx, with a kind of apnœa, which at any time may be complicated by convulsions or sudden death, due to spasm of the diaphragm or arrest of the cardiac action. The convulsions start suddenly with suspension of respiration and slowing of the heart. Breathing is resumed in a shallow manner and not by deep inspirations, as is usual in other cases. The face has an anxious look, which may be replaced later by one of vacancy. The eyes may have a fixed stare.

PLATE XXXVII.

TETANY

A case of the writer's showing the position of the limbs.

TETANY

A case of the writer's showing the facial irritability (Chvöstek's sign).

Treatment.—In most cases success attends treatment directed to three points: (1) The state of the *bowel*; (2) The hyper-excitability of the *nervous system*; and (3) The underlying condition—rickets. The first step in treatment is the administration of purgatives. **Castor Oil** serves the purpose admirably. Thereafter, if the stools remain unhealthy, small repeated doses of **Calomel** or **Grey Powder**, or **Salicylate of Bismuth** if there be diarrhœa, are useful. At first the diet should be restricted to milk, alone or diluted according to the age of the infant. The nervous state is satisfactorily treated by **Chloral** and **Bromides** given regularly and in sufficient doses, up to gr. 5 of chloral hydrate and gr. 10 of potassium bromide, three times daily for a child of one year old. As soon as the symptoms begin to diminish, **Cod-liver Oil** and **Malt** should be administered, which, with a suitable regime for rickets, should be persisted in for some months. In the class of cases described by the writer, **Washing out the Colon** with weak bicarbonate solution seemed to do the most good.

References.—[1]*Med. Rec.* 1911, ii, 559; [2]*Trans. Med. Soc. Lond.* 1911, xxxiv, 332; [3]*Monat. f. Kinderheilk.* 1911, x, 261 (*Brit. Jour. Child. Dis.* 1911, viii, 516); [4]*Berl. klin. Woch.* 1910, 1435.

THORAX, WOUNDS OF. (*See also* Heart, Wounds of.)

H. Hartmann, M.D., Paris.

It has been asked of late years, why do we not apply to injuries of the lung the principle of immediate operation, as we do to those of the abdomen? This was discussed at the 1911 meeting of the Société Internationale de Chirurgie. Lenormant,[1] who introduced the subject, advised against systematic interference in injuries of the lung. He regarded it as indicated in cases of fulminating hæmorrhage into the pleura occurring several hours after the injury; in free and continued hæmorrhage; in the presence of progressive ingravescence in all cases after several days; for moderate but persistent hæmorrhage, and finally, for recurrent hæmorrhage. Lejars regards stab-wounds as the paramount indication for operation; the lesion is a solitary one, it is not buried below the surface, and it is therefore readily discovered and easily accessible.

Speaking generally, we agree with Clément[2] that bullet-wounds should be left alone. If they are superficial, they heal readily when the lung has retracted; if the hilum is implicated, the patient dies before the surgeon reaches him. A case of Heile's[3] may, however, be quoted; he succeeded in saving a patient by ligature on either side of a revolver-wound of the vein emptying the left lower lobe near the hilum.

References.—[1]*Soc. Internat. de Chir.* Brussels, 1911; [2]*Rev. de Chir.* 1911, 879; [3]*Berl. klin. Woch.* 1911, 2336.

THYMUS, SURGERY OF. *H. Hartmann, M.D., Paris.*

Olivier,[1] in an important monograph on the topographical anatomy and the surgery of the thymus, has collected records of thirty-nine thymectomies, four exothymopexies, and four resections of the

manubrium, in the treatment of the *thymic hypertrophy* of childhood. He concludes that permanent dyspnœa with stridor and choking attacks in a child with a suprasternal swelling projecting from the mediastinum, and increase of the sternal dullness, should suggest a diagnosis of thymic hypertrophy, which may be confirmed by radiography if it shows a thymus shadow with sharp outlines, continuous with the cardiac shadow (*Plates XXXIX, XL*). In such cases radiotherapy is practically useless; exothymopexy and resection of the sternum give poor results, and thymectomy is the operation of choice.

Veau,[2] who has carried out this operation ten times, advises a **Partial Subcapsular Excision of the Thymus.** A vertical median incision, running down on to the sternum at its lower end, exposes a grey mass lying in front of the trachea and rising with expiration. He incises its capsule, seizes the exposed upper pole of the gland with a pair of Kocher's forceps to prevent its retreat during inspiration, and then frees the gland from its capsule with a director. By drawing it up more and more he succeeds in enucleating it completely, without exciting any hæmorrhage. The operation ends with suture of the subhyoid muscles and of the skin, without drainage.

C. H. Mayo,[3] who is also a champion of total ablation, prefers a curved incision in the lower part of the neck, severing the internal tendon of the sternomastoid near its insertion, and the sternohyoid muscles. By this method he has been successful in one case. Sheen[4] has twice attempted excision of a sarcomatous thymus, but both cases ended fatally. In one there were secondary deposits in the myocardium near the apex of the heart.

References.—[1]*Jour. de Chir.* 1912, 233; [2]*Presse Méd.* 1910, 257; [3]*Ann. Surg.* 1912, ii, 77; [4]*Lancet*, 1911, ii, 1253.

THYROID, SURGERY OF. (*See also* Goitre.)

T. P. Dunhill, M.D., Melbourne.

Indications for surgical interference in the diseases of the thyroid gland vary with the skill of the operating surgeon. In almost no other region of the body does the life of the patient depend so much on the judgment and dexterity of the operator. Cases, which in the hands of an expert surgeon who has constant practice in partial thyroidectomy would be perfectly safe, will as certainly die if subjected to indifferent anæsthesia, inexpertness, absence of precision, overhandling, crushing, or undue prolongation of the operation. A good and careful surgeon will lose cases if he takes a little longer than he should over the operation. The statements which follow must be read in the light of this reservation.

Indications for Operation.—Until recently it has been the practice to treat exophthalmic goïtre medically until such time as it became obvious that the patient was losing ground; operative treatment was regarded as a last resort.

During the last few years, chiefly on account of the work of Kocher, in Berne, and the Mayo brothers, in America, the practice has been

PLATE XXXIX.

SKIAGRAM OF CHILD BEFORE THYMECTOMY

Plates XXXIX and XL kindly lent by Dr. Olivier and the Publishers, G. Steinheil, Paris

PLATE XL.

SKIAGRAM OF CHILD AFTER THYMECTOMY

gaining ground of operating earlier, while the patient is better able to undergo a surgical operation safely, and is still well enough to render a complete recovery possible.

The chief questions which the profession is now striving to solve are: Is surgical interference justifiable, and if so, in which cases? How much gland substance should be removed? What procedures best make for the safety of the patient? In what condition is the patient some months and years after the operation? These questions will be answered here in the light of a personal experience based on 478 operations on the thyroid gland, and on 290 operations for true Graves' disease. No rule can be laid down, but each case will have characteristics which will place it in a class about which certain statements can be made.

Patients seen quite early, whose eyes are becoming staring, the pulse rapid, tremors beginning, the skin moist and hot, should be put to bed at once. Medical treatment and complete rest will occasionally arrest the progress.

If the case be well developed, or unimproved by eight or twelve weeks' medical treatment; if it be a typical example of *Graves' disease*, but without permanent dilatation of the heart, irregularity of pulse, œdema, albuminuria, or glycosuria, one lobe and the isthmus—if there be an isthmus—should be removed. (Details of the operation will be given later.) In some cases the result will be a disappearance of the hot feeling and of the perspiring condition of the skin, a lowering of the pulse-rate to 88 or 96 per minute, a disappearance of tremors, a decided gain in weight if there has been emaciation, a return of the menses if there has been amenorrhœa, and frequently a thicker growth of hair and eyebrows. In others, these changes will not occur, particularly if the remaining lobe is big and active; and in some, even if the changes do occur, there will be a return of the symptoms. In these cases, in three to six months after the first operation, a good half of the remaining lobe should be removed. The improvement is then immediate, and the results almost always permanent.

In some big goitres, the portion remaining after the second operation may be too large, or it may be difficult to judge how much has been left, as the portion not to be removed is never dislodged; then a third operation may be necessary.

In patients under twenty years of age, instead of removing a lobe, the writer, after a probationary period of rest and medical treatment, ligatures the superior leash of vessels on one side, under local anæsthesia. About ten days later the same is done on the other side. Often these cases will then become quite normal. If it be found necessary subsequently to remove a lobe, this can safely be done. Again, in very severe cases, where no more should be done than the least that will in any degree better the condition of the patient, it is wise to ligate the vessels first, and perform the major operation when all reaction has subsided. In the writer's opinion, ligation of

vessels does not assist by lessening the blood supply, but, as Crile suggests, by severing nerve connections.

Of cases operated upon in this stage of the disease, 85 per cent will be almost completely cured, and the remaining 15 per cent will be immeasurably improved—if enough gland tissue has been removed. Those which are only improved, will still have tachycardia on exertion, though in almost all, this gradually subsides and ultimately disappears. Exophthalmos is reduced, in some almost completely, in others not so much; in some rapidly, in some gradually for twelve months. Most patients feel the summer heat more trying than do normal individuals.

There is a big class of cases, in which the continuance of the disease has wrought visceral changes. The heart is dilated, and there may be albuminuria, or œdema. There is often mental trouble. In some such, the original disease has subsided, whilst its results remain. If the goitre has disappeared, or ceased to functionate actively, and the symptoms are not due to present thyroid poisoning but to visceral damage, the treatment must be medical. If the goitre is still active, the pulse rapid, and the skin hot and moist, much relief can be given to the patient by removing half or two-thirds of the gland under local anæsthesia. The tremors will disappear, the skin become cool, and the pulse quieter. Sometimes it will be found that the cardiac dilatation has not been due to intrinsic damage to heart muscle, and that after removal of most of the poisoning agent, it will completely recover its tone. Cases of this kind are to be operated upon only under local anæsthesia.

The writer has performed twenty-three operations upon this class of patient without losing one. They are still living, with the exception of one who died four months after operation. In all, œdema was present; in some it extended up to the body; in one the side of the face was asymmetrical, and one eye was frequently closed on account of the œdema. It is now five years since her operation, she has since been made Mother Superior of a convent, and is carrying out her duties. She is not cured, but is so much improved as to have justified abundantly the operation. The poisoning was stopped, and the heart recovered a great deal of its lost power. One patient with most irregular heart-beat, œdema, exophthalmos, complete loss of eyebrows, and thinning of hair on the front of the head, and who was quite invalided, was operated upon twice. Her heart is still irregular, but the œdema has disappeared, except after long walks; her eyebrows and hair have grown quite thick, and she leads a fairly active life. If space permitted, one could multiply instances.

The next condition to be considered is *adenomatous growth causing great irritability and activity of the surrounding thyroid tissue.* This activity may be such that the patient shows most of the symptoms of Graves' disease, and actually is suffering from thyroid poisoning. Operation is very easy; the adenomatous mass has made a bed for itself from which it shells out readily, and in a great number of cases the relief is prompt and complete. In a few, it will be found that

the skin remains hot and perspiring, and the pulse-rate high, until more thyroid tissue is removed. In one case, the writer removed an adenoma as large as a cricket-ball, and expected the patient to be better at once; three weeks afterwards, with the patient still in bed, the pulse remained over 120, often over 130, per minute, the skin constantly moist. Half the remaining lobe was then removed, and within a week the pulse was normal, and the skin cool and dry. The patient, a male, has for the last two years since operation managed a big business, and is completely well.

Simple adenomata rarely disappear with medical treatment. The growth may remain stationary, but its tendency is towards gradual but persistent enlargement. Removal is simple and safe, and no normal tissue is removed. The growth shells out of its bed of thyroid substance. An adenoma may cause great distress through its position by mechanical obstruction of trachea or œsophagus or veins. It may be situated deeply in the thorax. The writer has removed adenomatous masses as low down as the lower border of the second costal cartilage on both sides; there was scarcely any tumour in the neck; the *x*-ray showed a shadow in the upper part of the thorax. The tumour shelled out fairly easily on each side.

There may be several discrete adenomata in different parts of the thyroid gland which can be shelled out separately, leaving more or less normal tissue behind. More often, however, adenomatous masses are distributed throughout the whole gland. If large enough to cause disfigurement or inconvenience, the masses generally descend behind the sterno-clavicular articulation, and far back into the neck. It is best to dislocate the lower poles, remove the parts which are entering the thorax and spreading laterally, and then slice off the anterior prominent portions of the goitre. Occasionally, later, another adenoma will again enlarge and require shelling out, but usually the remaining portion of the thyroid gland does not give further trouble; in the writer's experience myxœdema does not follow. A good part of the deep portion of each lobe is always left, and the neck looks normal and symmetrical.

In *hypertrophy of the thyroid gland, without general symptoms*, each case has to be considered. If moderate in size and not unsightly, it may well be left alone. If very large, or causing pressure symptoms, part should be removed, the portion depending on the position of the pressure. If removed for great size, the larger lobe should be removed first, and later, a cosmetic result obtained by re-opening through the scar and removing the lower pole and a slice right down the front of the remaining lobe. These patients, after operation, improve in general health, lose much of their lethargy, and become a better colour. The writer recalls two cases of parenchymatous goitre which, after nearly thirty years, became sarcomatous, and several which became severely exophthalmic in type after having existed for many years as an apparently inactive hypertrophy.

Operative Treatment.—The *local anæsthetic* is composed of novocain gr. 6, solution of adrenalin chloride (1–1000) 20 min., physiological saline solution 7 fl. oz. That is the amount for each operation. The whole of the front of the neck is infiltrated with the solution, subcutaneously, and then into and below the fascia and muscles; one feels and guides the point of the syringe as one does the point of a catheter through the perineum. It is well to wait at least half an hour after injecting before beginning to operate. The advantages of local anæsthesia are that many cases are only safe with its use; that the recurrent laryngeal nerve can be better guarded, and that the absence of post-operative vomiting permits the ingestion of much fluid after operation.

There should be no fear in the mind of the patient. If the surgeon cannot obtain full trust and confidence, and retain them through the operation, he should not attempt to operate under local anæsthesia.

The *incision* is of the true " collar " type, *not* U-shaped; it extends from the centre of the sternomastoid muscle on one side, to the corresponding spot on the other. Skin, subcutaneous tissue, and platysma are reflected, with upper and lower flap. The deep fascia is divided in the middle line and the muscles are separated down to the thyroid gland; muscles may be divided high up, although the writer never does so, except in the case of the largest goitres. Every film of areolar tissue that surrounds the gland is picked up and divided until the thyroid substance itself is reached. The tip of the handle of the scalpel is better than any other instrument for inserting between muscles and fascia above, and gland below, to start the separation, and then a forefinger. The separation is gently but firmly completed to the lateral border of the lobe, and from upper to lower pole, before any retraction is made on muscles with instruments. When the limits of the lobe are accurately defined with the inserted finger, the upper pole is gripped firmly between forefinger and thumb and dislocated, whilst the infrahyoid muscles are retracted with a small double-hook retractor; a strong pair of forceps grips the superior entering vessels, another pair surrounds the upper pole to control reflux bleeding, and the vessels are divided. On lifting the upper pole by traction on the second pair of forceps, it will be seen that a definite fascial compartment has been opened behind the upper pole, into which a forefinger can be readily inserted. This is because the fascia which covered the front of the gland divides into two layers at the lateral angle; one layer runs off in front of the carotid sheath, while the other finer layer closely encloses the gland posteriorly. This fascial compartment is always present, and if the gland is attacked in this way, it will never be found adherent behind, except the small part which covers the cricoid cartilage or first ring of the trachea. With the lobe pulled over to the opposite side, a thumb behind in the fascial compartment, and the forefinger on the anterolateral surface of the gland, the fascia on the lateral surface is put on tension, and can be peeled back from the gland with a pair of blunt dissecting-forceps, without rupturing vessels.

With this fascial capsule are also peeled back the parathyroid glands, and the recurrent laryngeal nerve (if the latter be seen at all).

Two points here require attention: a pear-shaped protruberance from the posterior aspect, just above the middle of the lobe, which, with care, can be completely shelled out of its investing fascia, and, just below it, a plexus of veins which is presumably the anatomist's middle thyroid vein. These are clamped in one pair of forceps and divided. If the lower pole be then lifted, it will put the inferior vein on the stretch; it should be clamped and divided; then the only structures fastening down the lateral aspect of the gland are the branches into which the inferior thyroid artery has divided as it enters the gland. When these are clamped and divided, the lobe can be rotated inwards, and its posterior surface shelled off the trachea, to which it is attached by areolar tissue everywhere except one spot on each side high up. Here it apparently grows directly on to the lower border of the cricoid and the upper ring of the trachea.

In any goitre requiring partial removal, the isthmus has been mostly taken up by the lateral lobes, and an almost complete division will usually be found between the two lobes. If there is not a division, the gland is partly cut and partly torn across in the mid-line, and the bleeding points picked up, or under-run with fine non-chromic catgut. The writer usually removes what is required from the second lobe at once, unless the patient is very ill; but this procedure is not to be recommended unless the surgeon is experienced in operating upon goitres.

The fascia over the front of the second lobe is divided, upwards and downwards. The lower pole and mid-part of the lobe are completely freed. The lower pole is delivered, but not the upper—that is left *in situ*. A clamp forceps is applied around the veins and fascia, binding down the lowermost part to the trachea; five or six forceps are applied to the gland, over the site of entering vessels, along an elliptical line extending from the posterior part of the lower pole, around the postero-lateral surface, to the anterior part of the upper pole. These act as guys to prevent the gland slipping back, and when the gland tissue is divided they control most of the hæmorrhage. The gland is then cut obliquely across in front of the line of forceps, along a line passing from the back of the lower pole around to the front of the upper pole. This removes the large lower part, leaving a slice which is thicker above than below. The upper pole with its blood-supply remains intact and *in situ*. The recurrent laryngeal nerve and parathyroids are protected behind. The chief hæmorrhage from the cut surface is from two points, one on the inner aspect of the lower part, and one near the inner aspect of the upper pole. These can be controlled with forceps. The guys are all ligated, and any other bleeding points under-run with catgut. One split drainage tube lies along the cavity from which the lobe has been removed, another lies along the raw surface of the second lobe. Both emerge from a stab wound in the lower flap.

The *after-treatment* in cases of Graves' disease consists of: (1) Copious ingestion of water by mouth. The patients are thirsty, and drink readily; (2) Aspirin, gr. 10, repeated, to relieve the pain and stiffness felt for some hours afterwards; (3) Removal of tubes forty-eight hours after operation.

Complications.—(*a*). *Thyrotoxicosis* is best guarded against by rapid, gentle operating, *no* crushing of gland tissue, efficient drainage by *tubes* (not gauze), copious ingestions of water, and avoidance of operation during an acute exacerbation of the disease. Crushing of gland tissue by rough manipulation or by "isthmus" forceps, courts disaster. If tissue is bruised, it must be carried off by the lymphatics and venules of the gland, and in this way much toxic material is discharged into the system instead of out through the tubes. Tubes give more efficient drainage than gauze, and gauze is liable to loosen ligatures as it is withdrawn.

(*b*). *Hæmorrhage* is liable to occur under two sets of conditions: (i) Soon after the patient has gone back to bed, through the slipping of a ligature. It occasionally happens that a tag of muscle or fascia is caught in the ligature round branches of the superior or inferior vessels. With the movements of the larynx in coughing, vomiting, or swallowing, the tag may loosen the ligature; the same movements may rub a ligature off, which has not been efficiently fixed, anywhere in the operation field. In no other part of the body are there the same constant movements of the site of operation under the overlying structures. If hæmorrhage occurs, the wound must be completely opened at once, clot turned out, and the bleeding spot caught. No pressure by gauze will control it—there are no firm structures behind on which to exert pressure, and to attempt it is only to lose valuable time and endanger the patient's life; (ii) If gauze drainage has been employed, the rough gauze may easily loosen or rub off a ligature and separate clot as it is withdrawn. A tube is more effective as a drain, and causes no trouble on withdrawal.

(*c*). *Mucus in the Trachea and Bronchial Tubes.*—One of the strongest contra-indications to operation is bronchitis—even the mildest catarrh of the air-passages. The operation often induces the collection of mucus in the trachea, especially if general anæsthesia has been used; and the wound in the neck makes coughing painful. If, with this, there has been already some tracheal irritation, the patient may become quite incapable of expelling mucus; the respiratory and pulse rate rapidly rise, and the patient dies.

If this arises rapidly, atropine should be pushed hypodermically until the throat dries, and oxygen be administered very judiciously. The surgeon should not leave the bedside until the patient is comfortable. If the condition does not occur rapidly, but irritates persistently, belladonna should be given by the mouth in several large doses.

(*d*). *Tetany.*—In 490 operations on the thyroid gland, many of them most extensive, the writer has never seen any indication of tetany.

The Results of Operation in cases of Graves' disease must be viewed from two aspects—the safety of the operation, and the end-results.

As regards the *safety* of the operation, the death-rate with the best operators is from 2 to 4 per cent. It is scarcely likely to be lower than 2 per cent, and it is only as high as 4 per cent if the risk is taken of operating on patients who are very ill. This risk must be taken at times, because even very bad cases may be operated upon with a fair measure of safety if every precaution is used. The writer lost 2 per cent; one case from hæmorrhage, another was moribund when operated on.

As regards *end-results*, actual statistics are most misleading. In nearly every patient who is free from visceral disease, if enough diseased tissue be removed, recovery is almost complete. "Almost," because although a great number of those who have been very ill will become quite well, many others will have still a little rapid heart-beating at times, and in various ways will not be quite as well as if they had never suffered from the disease. This admission must not blind us to the fact seen in almost every case, that women and men who were completely invalided, have become in a few weeks or months able to live normal lives, and to engage in the work and pleasure of life with zest.

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Appended is a brief abstract of some of the more important papers recently written on thyroid surgery.

Prof. Kocher[1] discusses at some length the blood changes in hyperthyreosis and hypothyreosis. In the former he finds a great diminution of the polynuclear cells—from 5000 to 1260 per c.mm.—whilst the small mononuclear cells show a relative increase. Changes in coagulability also occur. There are undoubted cases of Graves' disease in which no important blood changes are to be found. Evidence of inter-relation between the thyroid and adrenal glands is given. After operation, the blood returns to the normal in direct ratio to the amount of diseased thyroid tissue removed—just sufficient gland tissue being removed to effect relief of the symptoms. The influence of iodine and thyroidine on the gland is discussed, and the influence of irritation of the nervous system, affecting especially the sympathetic branches of the thyroid nerves.

The same writer,[2] speaking of the mechanical results of goitre, says that early involvement of the respiratory tract should excite suspicions of malignancy. In his last 1,000 operations, 26 were performed on malignant cases without death at the time, though recurrences occurred. The site of the tumour in the gland determines to a great extent the mechanical symptoms. A very small adenoma on the posterior surface of the isthmus may give much trouble, and operation alone gives relief. When the enlargement arises in the lower pole, the tendency is for the tumour to become intrathoracic. In intrathoracic

growths a warning is given against iodine medication. The " iodine-heart " may be easily induced. Operation is indicated. In the last 1,000 operations there were 91 with intrathoracic development. Of these three died, but one was operated upon in the consulting-room to relieve urgent dyspnœa, and one other had an aneurysm which ruptured. The diagnosis is made through the disproportionate dyspnœa, the venous engorgement distal to the pressure, by percussion, and the use of Röntgen-rays.

In 320 cases of exophthalmic goitre in which results could be traced, 150 were completely cured ; 148 were almost completely cured or very greatly benefited. In 22 cases the results were unsatisfactory. His operative mortality is 3 to 4 per cent.

Porter[3] writes that too little distinction has been made between the purposes sought by operation for fibroids and appendicitis, and that sought in operation for Graves' disease. In the first instances the surgeon may really cure the disease by a radical removal ; in the latter, all that is actually attempted is to *modify the functions of an over-active gland.* After all the ligature operations, and even partial thyroidectomy, enough thyroid tissue is left behind, which, if it hypertrophies, or the patient is subjected to the same influences which brought about the original disease, may again become overactive, and cause a recurrence of symptoms. If this conception of Graves' disease be a correct one, the physician or surgeon must be careful in promising permanent cures, and he need not be surprised, if examination is made with sufficient care, to find that many cures should be more properly ranked as permanent improvements. All cases should be treated medically at first. In the poorer classes, operation should be performed earlier. When tumours are present, operation should be done early, in a quiescent period. Relapsing cases should be operated upon before chronic myocardial changes make the case incurable. Severe chronic exophthalmos is an indication for operation. In very acute Graves' disease, if medical measures give no improvement, a minor operation under cocaine, with ligature of arteries or veins, should be done in the majority of cases, with excision later if necessary. He pleads for greater co-operation between the physician and the surgeon, both before and long after operation, in order to get the best and most permanent results.

C. H. Mayo,[4] discussing the results of operation in 1100 cases, says that the condition in the majority of cases is not so extreme that a partial thyroidectomy cannot be made with comparative safety. Elsewhere[5] he states that within the past year there have been operated upon, at St. Mary's hospital, Rochester, U.S.A., a consecutive series of 278 cases of exophthalmic goitre, without a death. Conditions which necessitate postponement of operative interference until medical measures have rendered it safe, are exacerbation or excessive activity of the disease ; gastric crises or acute delirium. Dilatation of the heart exceeding one inch is serious, but if the dilatation be an inch and a half it will introduce a percentage of unavoidable mortality. Such

cases are now being treated, after medical preparation, by an early safe ligation of vessel groups at the upper poles. Very serious conditions, complicated with dilatation of the heart, fatty degeneration of the heart and liver, nephritis, and possibly œdema and cerebral incoordination, are also benefited by a ligation of the vessels at the upper poles, at the same time or at separate operations. The mortality in these cases is about the same as for thyroidectomy, but the operation enables the operator to make an effort to relieve some of the patients who are too nearly moribund for an extirpation.

The average gain in weight following operation upon patients below average weight is twenty pounds within four months. At this time, or later, a partial thyroidectomy can be made with almost no mortality, especially if patients who have relapsed are again tided over the exacerbation period by the ligation of one inferior artery, with an interval of a few months before extirpation is made. These conditions are due to an activity of function of the gland, and some few cases do not recover their normal health after operation because either too little of the gland was removed or the remaining portion of the gland increased its size and output of secretion. Such cases require ligation of some of the vessels, and a resection of the remaining lobe may even be necessary at a later period.

Delore and Alamartine[6] give an exhaustive report of their work in investigating the blood supply of the thyroid gland, and the areas supplied by the various afferent vessels. The anastomoses of the arteries have been worked out by injection methods. The result of ligature of vessels on thyroid secretion and the innervation of the gland is examined. Diagrams are given with incisions marked out, and measurements by which vessels may be best ligated. Indications for ligature are given, and the results obtained by ligature of arteries alone or combined with gland excision.

Delore[7] reviews the operations for the relief of exophthalmic goitre, performed on the thyroid gland and on the cervical sympathetic system. He gives a *résumé* of the technique in each type of operation, with modifications of each, and some statistical results. He considers that practitioners in France and Belgium are more conservative in their treatment of the condition than practitioners in other countries.

Groves and Joll[8] report a case of tetany following almost complete excision of the thyroid gland in two stages in a case of exophthalmic goitre. There was one severe attack of four days' duration, commencing five days after the second operation, and several slight attacks during the following six months. Some human thyroid gland, and two parathyroids, were grafted under the sternomastoid muscle of the left side, under novocain anæsthesia. This was followed by a severe attack of tetany, lasting twelve days. The symptoms were then relieved by hypnotic suggestion. The case was reported six weeks afterwards, and the patient was then improved generally, and during that period there had been no recurrence of tetany.

These authors give a careful review of the work done in thyroid transplantation. Christiani uses small fragments of thyroid tissue, the size of wheat grains, and places each by a separate small stab wound in the subcutaneous tissues of the neck and shoulder regions. As many as thirty-eight pieces were implanted in one patient on two different occasions. This patient had suffered with predominant symptoms of myxœdema, and some of those of Graves' disease, and after three years the whole thyroid gland was removed, when the symptoms of myxœdema became intensified. The transplantations were then performed. Six months later, the patient became pregnant, and in due course was delivered of a normal child. Kocher transplants into the tibial marrow, and operates in two stages to secure hæmostasis. An envelope of clotted blood would offer a barrier to rapid vascularization of the grafts.

C. H. Mayo and Bernand F. McGrath[9] discuss the question of parathyroids and their surgical relation to goitre. They analyze the evidence of the relation of the parathyroid glands to tetany from the experimental and histological points of view. The importance of calcium in conditions of tetany is spoken of.

For treatment, 5 per cent solution of calcium acetate or lactate is used intravenously. This almost instantly cures the violent symptoms of tetany, though the result lasts only twenty-four hours.

However the salts of calcium and other salts may be concerned in maintaining a state of equilibrium in the function of the nervous system, and whatever may be the relation of the parathyroids to calcium and other metabolism, recent investigators state that all their experiences with tetany have shown that insufficiency of these glands is necessary for the production of tetany. This insufficiency occurs in experiments through removal of parathyroid tissue ; and in the *idiopathic tetany* of man it is caused by a hypoplasia of the parathyroids consequent on pathological processes, for example, hæmorrhage, which may have occurred in early life. The parathyroids have functionated sufficiently to maintain healthy life until some added strain, induced through pregnancy or gastrointestinal disturbances, upsets the equilibrium and induces the attack.

The surgical importance of this is to ensure scrupulous care in operating, and if a gland be removed it should be implanted at once beneath some parts of the remaining capsule. Treatment consists in compensating for the glandular deficiency by transplanting parathyroids from other individuals ; feeding with animal glands ; the use of serum or the extract of parathyroid tissue, and the administration of calcium salts. The results are not dependable. In over 3,000 operations on the thyroid gland in St. Mary's Hospital, Rochester, U.S.A., there has been only one case which manifested signs suggestive of tetany.

Brown[10] reports a case in which tetany followed an extensive removal of thyroid gland. The tetany was very persistent, and the history most interesting. Calcium lactate did not influence it. Emulsion of ox parathyroids gave relief in one attack. In some very severe attacks

Chloral Hydrate, gr. 5, hourly, caused relaxation of the spasm after the third dose, and permitted sleep. In other attacks, amyl nitrite had no effect, and chloroform seemed to make them worse. Relief followed subcutaneous implantations of parathyroids taken from living dogs. The attacks persisted, the pain being so severe that the patient wished to be put out of his misery. The whole thyroid, with two and perhaps three parathyroids, from a small monkey, was implanted beneath the sternomastoid muscle. Later, three parathyroids and a piece of thyroid from a man who had died of Bright's disease, were implanted. After this there was complete recovery. Attacks of tetany had occurred from April 23rd until August.

Crile,[11] after discussing the variously proffered reasons for *acute hyperthyroidism following operation,* advances the opinion that fear is the predominant one. He has had observations made on stained sections of rabbits' brains: the cells of the brain that were secured in the midst of fright showed marked hyperchromatism; those that were taken several hours later showed remarkable chromatolysis, a disturbance of the nucleus plasma relation, and some broken-down cells. On examination, the brain of a patient who had died of Graves' disease showed in the cortex marked chromatolysis, the nucleus plasma ratio disturbed, and many cells destroyed.

To reduce the influence of the psychic factor, Crile makes " a careful inventory of the pathologic physiology " of each case. Confidence is instilled into the patient; the reaction to small doses of morphine and scopolamine is ascertained. Then daily inhalations, which are presumably for some medicinal purpose but are precise rehearsals of ether anæsthesia, are practised by the anæsthetist. Ether is tentatively dropped on the inhaler, along with the volatile oils, and the patient is cautiously, without her knowledge, tested as to ether anæsthesia—sometimes is completely anæsthetized; all this in her own bed. After the results have been studied, it is decided whether excision or simple ligation is to be performed; the patient is given morphine and scopolamine on the appointed morning, is kept absolutely quiet, is then gently anæsthetized to the second stage, in bed as before, and is at once taken to the operating room, where nitrous oxide is substituted for ether. The operative field is as completely cocainized as if no general anæsthesia were being given.

First the skin and fascia of the opposite side are incised for about one inch; through this incision, by means of a full-curved needle, the upper pole of the gland and all the overlying tissue inclusive are firmly ligated. Then, in the gentlest possible manner, the opposite lobe is excised bloodlessly, traction on any uncocainized sensitive tissue being absolutely avoided—precisely as if the patient were awake. After the operation, the utmost care is exercised to keep down to a minimum psychic and painful stimuli. Crile believes that ligation of the superior thyroid pole is effective, not because it lessens the blood-supply, but because it breaks part of the nerve connection with the brain.

Ochsner, of Chicago, anæsthetizes completely with ether by the drop method, then places the patient in the inverted Trendelenburg position, so as to produce an anæmia of the brain, and performs the operation without giving any further anæsthetic.

C. H. Mayo[12] discusses lingual, sublingual, and other forms of aberrant thyroids. Suprahyoid or immature tumours must be diagnosed from malignant glands, thyroglossal duct cysts, dermoids, ranula, lingual tonsils, etc.

Sublingual thyroids are removed through a transverse incision in the hyoid region, with separation of the muscles. In lingual goitres the tongue and pharyngeal regions are cocainized, the patient is anæsthetized with ether, and a rapid operation made whilst the tongue is held in extreme tension. The free hæmorrhage is controlled by deep sutures. In very extensive superior lingual goitre it may be advisable occasionally to ligate the lingual arteries and make a laryngotomy as a preliminary procedure.

REFERENCES.—[1]*Brit. Med. Jour.* 1910, ii, 931 ; [2]*Deut. Med. Woch.* 1912, 1265 and 1313 ; [3]*Bost. Med. and Surg. Jour.* 1910, ii, 725 ; [4]*Med. Rec.* 1910, Dec. 31 ; [5]*Jour. Amer. Med. Assoc.* 1912, ii, 26 ; [6]*Rev. de Chir.* 1911, 391 ; [7]*Ibid*, 1910, 1015 ; [8]*Brit. Med. Jour.* 1910, ii, 1965 ; [9]*Ann. Surg.* 1912, i, 185 ; [10]*Ibid.* 1911, ii, 305 ; [11]*Jour. Amer. Med. Assoc.* 1911, i, 637 ; [12]*Ibid.* ii, 784.

TONGUE, CANCER OF. *Priestley Leech, M.D., F.R.C.S.*

TREATMENT.—In any but slight operations on the tongue, Newbolt[1] considers that a *preliminary laryngotomy* is of very great service. Where the growth is well forward and easy to get at, it is not necessary ; but in other cases, and in removal of the upper jaw, it is very useful. The tube is generally removed the following morning. If the growth is so far back that the sponge plugging the fauces cannot be placed, high tracheotomy should be performed, the trachea plugged, or a Hahn's tube used. The chloroform can be given on lint held over the tube, avoiding the use of Junker's inhaler. In one case this apparatus was not working properly, and the patient received a dose of pure chloroform down the larynx, provoking a quickly fatal bronchopneumonia. He prefers a two-stage operation.

Rendle Short[2] gives the results of thirty-eight cases of operation for cancer of the tongue, of which twenty-nine have been followed up. Two died of the operation—one of septic absorption, and the other of gangrene of both lungs. Out of twelve whose glands were not removed, one was apparently cured ; perhaps as many as six were cured out of seventeen whose glands were removed. Of five cases where it was necessary to divide the jaw, four showed recurrence, three of them locally, and another died soon after operation. The site of recurrence was known in fourteen instances ; three in the mouth, seven in the glands, three in mouth and glands, one in the spine. In several instances, careful sectioning of the glands excised showed no cancer cells ; in two of these the growth nevertheless recurred in the neck. In three, the cancer was preceded by a dental ulcer ; one of these ulcers was excised, and reported by the pathologist to be innocent, but proved

malignant eighteen months later. Another followed two years after excision of a papilloma. Partial removals of tongue were followed by local recurrence in six out of twenty-nine cases. Of the seven apparently cured, one died of cancer of the œsophagus, one has been free from recurrence two and a half years, one for two years, two for five and a half years, and one for eight years.

REFERENCES.—[1]*Liverp. Med.-Chir.* 1912, 121 ; [2]*Brit. Med. Jour.* 1912, ii, 877.

TONGUE, DISEASES OF. *George L. Richards, M.D.*

Carter[1] finds the *black hairy tongue* more frequent in men than in women, and that the majority are excessive tobacco-users. The disease may be acute or chronic, lasting from a few days to fifteen years. It occurs mostly in middle-aged people. The author believes the affection is due to a local nutritive disturbance, and the growth of the filiform papillæ is similar to that of papillomata in other parts of the body. He reports two cases.

Forsyth[2] discusses *cysts* of the tongue, and advises complete removal whenever they occur, since incision, giving only temporary relief, admits of the possibility of recurrence.

REFERENCES.—[1]*Laryngoscope*, 1912, Aug. ; [2]*Ibid.* 1911, Dec.

TONGUE, SMOOTH ATROPHY OF. *Priestley Leech, M.D., F.R.C.S.*

Milne,[1] of New York, has investigated the causation of smooth atrophy of the tongue. It may occur occasionally in other conditions besides syphilis, as in certain tuberculous cases and in association with general wasting. Out of twenty-five cases of smooth atrophy of the base of the tongue, in which syphilis could not be definitely determined, seven were tuberculous. Syphilis, however, is the most frequent cause.

REFERENCE.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1040.

TONSILLITIS, EPIDEMIC. *E. W. Goodall, M.D.*

During the months of January to March, 1912, the city of Baltimore was visited by an epidemic of sore throat of a severe, even malignant, character. The disease attacked children rather than adults. The onset was sudden, with vomiting, a rigor, in infants a convulsion, and the older children complained of sore throat. On inspection, the fauces were observed to be inflamed and to present a dusky-red colour. Later, follicular tonsillitis, peritonsillar inflammation, and suppuration (quinsy) resulted.

As a rule, however, the local faucial lesion was moderate as compared with the constitutional disturbance. The temperature rose quickly, in some cases to a considerable height (one 105° F.), and remained irregularly raised for several days, and even two or three weeks. In most cases, during the first week the cervical glands became enlarged, forming visible swellings on each side of the neck. In some cases suppuration supervened ; in others the glandular inflammation subsided and the glands regained their normal state ; in others again, chronic

enlargement was the result. Dr. Hamburger[1] states that "a large and persistent bubo was regarded as of good omen; for in the fatal cases the glands were only moderately enlarged and quickly diminished in size." In many cases the liver and spleen were enlarged, and abdominal pain was common. Prostration was a frequent symptom.

The course and duration of the disease were very variable. In the mildest cases the patient was ill only three or four days; in the most severe there was septicæmia, and the illness lasted for three or four weeks. Relapses were not uncommon. The following complications were observed: otitis media, suppuration of the cervical glands, arthritis, tenosynovitis, nephritis, peritonitis, and erysipelas. Fatal cases were not infrequent, and death was usually the result of peritonitis or septicæmia.

According to Hamburger the cause of the disease is "an end-to-end diplococcus, intracellular in some specimens. Each pair seems surrounded by a halo, but with the capsule stain of Welch, Benger, and His, no envelope can be demonstrated. It coagulates and acidifies milk, and in this liquid it develops in long chains with end-to-end arrangement, and sometimes in tetrad form." The cocci are gram-positive. Hamburger gives reasons for believing that the epidemic was due to contaminated milk, though at the time he wrote his paper the source of contamination had not been discovered.

Hirschberg,[2] in a very brief account of the same epidemic, states that the disease is caused by an encapsulated diplococcus, which is the pneumococcus, and that it was impossible to prove that it was spread by means of milk.

A milk epidemic of sore throat was present in Chicago at about the same time as the Baltimore outbreak (Miller and Capps[3]). A similar epidemic prevailed in Eastern Massachusetts in May, 1911 (Winslow,[4] Darling,[5] Richardson,[6] and Goodale[7]). Darling states that the incubation period of the disease is from thirty-six to seventy-two hours.

The Massachusetts outbreak was exceptionally severe, and there were a number of fatal cases. An interesting feature of this outbreak was that the incriminated milk was supplied by a dairy company particularly careful in respect of precautions against contamination. Yet in spite of these the milk was infected, most probably directly from one of the employés. There was no disease amongst the cows from which the milk was obtained. In this epidemic the causative bacteria were streptococci, often associated with staphylococci or pneumococci.

In later papers Capps and Miller,[8] and Heinemann,[9] give a detailed account of the Chicago epidemic and its relation to the milk-supply. Clinically, the affection was much like that of the Baltimore outbreak. Often, however, there were patches of exudate on the fauces resembling the membrane of diphtheria; and not infrequently there was extreme faucial œdema. In many cases there was bradycardia, absolute as well as relative (to the temperature). The epidemic was due to milk from a certain dairy. An unusual prevalence of mastitis was found

amongst the cows of certain of the farms which supplied the dairy, and sore throat was also prevalent amongst the farm hands. The milk was supposed to be pasteurized before delivery to the consumers; but the system adopted was the so-called "flash" method, by which the milk was supposed to be heated momentarily to 160° F. But this method of pasteurization failed on several occasions, as was shown by the automatic records. The epidemic in Chicago assumed the form of a series of explosive outbreaks coinciding (allowing for the incubation period of the disease) with the failures in pasteurization. According to Capps and Miller it was "conservatively estimated that over 10,000 persons in Chicago were victims of epidemic sore throat." D. J. Davis[10] found the outbreak was caused by an organism belonging to the streptococcus group, usually, though not always, encapsulated. It closely resembled *Streptococcus pyogenes*. The organism was recovered from the cases of bovine mastitis as well as from affected human beings.

In the Baltimore epidemic, Luetscher[11] also found that the causative organism was a streptococcus of the pyogenes group. Further, he states that "many of the cases belong to the *Streptococcus anginosus* group, and that the behaviour of the streptococci from these cases was not very different from that of the streptococci complicating severe cases of scarlet fever."

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1109; [2]*Ibid.* 1189; [3]*Ibid.* 1111; [4]*Boston Med. and Surg. Jour.* 1911, ii, 899; [5]*Ibid.* 904; [6]*Ibid.* 907; [7]*Ibid.* 908; [8]*Jour. Amer. Med. Assoc.* 1912, i, 1848; [9]*Ibid.* ii, 716; [10]*Ibid.* i, 1852; [11]*Ibid.* ii, 869.

TONSILS, DISEASES OF.

George L. Richards, M.D.

Tonsillectomy. — There is more or less difference of opinion as to the indications for the removal of the tonsil. One school maintains, with Swain,[1] that the tonsil has a definite function and is of value in the young. While enlarged faucial tonsils may be treated by tonsillotomy or shrinkage, tonsillectomy is justified only when the gland is diseased and the patient over ten years of age, and in children some healthy tonsil should always be saved. Mackenzie[2] emphatically denounces its enucleation unless it is diseased and interferes with phonation. A radical operation should not be done without definite and sufficient reason. He considers the tonsil to be of definite use, and not necessarily a portal of infection. Crockett,[3] on the other hand, recommends removal when tonsils are mechanically obstructive to breathing and nutrition; when associated with enlarged glands of the neck; in cases of articular rheumatism whenever the tonsil is a possible etiological factor, and in all cases of repeated peritonsillar abscess.

TECHNIQUE.—The prevailing opinion of the best operators is in favour of tonsillectomy, although a few still cling to tonsillotomy. When there seems pure hypertrophy without much apparent disease, the tonsil is removed largely on account of its mechanical obstruction. There is little new in the technique other than the necessary

variations incident to individual operators. The method of Sluder is coming into more general use, and already has considerable support in the literature.—G. L. R.]

Tenzer[4] has done 1000 tonsillectomies by the Sluder method, without narcosis. It is much more painful than the simple tonsillotomy, as the instrument is used with considerable force and is pushed rather hard against the jaw, causing pain which local anæsthesia lessens but cannot abolish. The immediate bleeding was more than after tonsillotomy, but there was no late hæmorrhage in the entire series. When the operation was performed in adults, there was more bleeding, severe in four or five cases, the source of the blood being the pillars or floor of the tonsil fossa. The bleeding points are grasped with forceps and ligated, or a gauze sponge is placed in the fossa and compressed with Mikulicz forceps. The borders of the pillars did not show any signs of bad handling, so often seen after the so-called surgical tonsillectomy. He recommends the operation, and considers its results much better than tonsillotomy. A certain trick, requiring considerable practice, is necessary in order to remove the tonsil in this manner. Rood[5] modifies the Sluder method by passing the snare over the tonsil external to the already applied guillotine after the gland has been passed through the window of the guillotine under the guidance of the finger. Tightening the snare, he removes the tonsil in the usual manner.

Whillis and Pybus,[6] in two articles, describe their experiences of enucleation of the tonsil with the guillotine after the manner of Sluder (see MEDICAL ANNUAL, 1912). In their first series of 200 cases, they were able to enucleate 42 per cent complete in their capsule in one piece. In a more recent series of 100 cases, 74 per cent were enucleated complete. Their usual anæsthetic is ethyl chloride, and a guillotine modified after that of McKenzie is used. Various sizes of these guillotines should be at hand. When anæsthetized, the patient is turned partly over on to the right side, the head lying on its right side on a level with or slightly above the trunk, so that the cheek pouch is on a lower level than the fauces, and blood may readily collect and run out of the mouth. The gag is opened. The guillotine, with the shaft specially thickened, is first used as a tongue depressor, and the lower tonsil is thus seen. The operator stands on the patient's right, facing his head. With the guillotine held in the right hand, the ring is passed under the lower border of the tonsil, which is pressed upwards towards the soft palate. The left index finger is then placed on the outer part of the anterior pillar of the fauces, to press the tonsil into the ring. At this time the blade is gradually pressed home with the thumb of the right hand. It enters between the tonsil and the anterior pillar, cutting the mucous membrane connecting the two. While cutting, the hand is gradually pronated, so that the under surface of the guillotine looks inward and finally upward, the tonsils being separated from the pharyngeal wall during this manœuvre; the final cut severs the mucous membrane connecting it to the anterior pillar. The tonsil

is then lifted out on the under surface of the guillotine, which is now uppermost. The right tonsil is removed first. To remove the left or upper tonsil, the patient is rolled back so that the head lies in the dorsal position. The operator now passes to the left side of the patient, the guillotine is again inserted, and the ring passed below and behind the tonsil, which is pressed upwards toward the soft palate, the left index finger being again used to force the tonsil into the ring. The connections are cut through as described above, the hand being meanwhile pronated, and the tonsil is removed on the under surface of the guillotine, which has come uppermost. In less than half the cases the tonsil can be felt to slip into the ring, and in these it frequently comes out entire. In others it will not engage, and one can say definitely that two or more attempts will be necessary to remove the whole tonsil.

Beck[7] has devised a snare with a heavy fenestrum, for the removal of the tonsil, using Sluder's technique. The snare is tightened after the tonsil has been led through the fenestrum, until it disappears under the finger. The patient is under general anæsthesia, and is in the recumbent position. This method removes the tonsil with capsule complete. Proctor[8] describes in detail a technique somewhat similar to Sluder's. Guthrie[9] recommends the Sluder method.

Syme[10] enucleates embedded tonsils with the snare in the following manner: A pair of broad toothed forceps is passed through the loop of a Krause nasal snare which is allowed to hang on the forceps, and the tonsil is grasped in its long axis, gripped well, and drawn towards the middle line. A non-cutting slightly curved elevator is passed through the plica semilunaris, and a sweep is made downwards, separating the anterior pillar, pressure being at the same time applied by the elevator in order to draw the tonsil out of its bed. The posterior pillar is then treated in the same way. The upper part of the tonsil emerges from between the pillars, and the snare is passed over it and drawn tight, the point of the barrel being pressed against the lower end of the anterior pillar. To avoid hæmorrhage, the snare is left on while the other tonsil is removed.

Dickie[11] has used Sluder's method in fifty cases, with 74 per cent of complete enucleations. Success depends on thorough pushing of the tonsil through the ring of the guillotine. Wood[12] first does a **Tonsillotomy,** and then breaks up the tonsils with the left forefinger, beginning at the supra-tonsillar fossa and gradually working downwards, and exercising firm counter-pressure with the right hand. The patient expectorates the broken-up tonsil into a basin. The advantages claimed are ease of operating, slight hæmorrhage, and a clean supratonsillar fossa. Two or three hours after the operation, Wood gives $\frac{1}{10}$-gr. **Calomel** tablets, one every five minutes, as many as the child is years old. Adults are given sixteen to eighteen tablets. He claims that in antiseptic action they are superior to formalin.

Complications.—Dutrow[13] reports 206 tonsillectomies, with only five severe *hæmorrhages*. He applies **Tincture of Iodine** to diminish the

trauma after the operation. Hopkins[14] reports two cases of secondary hæmorrhage after tonsillectomy ; one occurred nine days after the operation, and the other on the fifth, tenth, and twelfth days. Pressure upon the bleeding point with a tonsil clamp stopped it. These cases were in adults, and were operated upon under general anæsthesia. Cocks[15] has found **Lactate of Calcium,** given previous to the operation, lessens the hæmorrhage. He advises slapping the face vigorously with a towel wrung out in ice-water for a few minutes immediately after the operation. If there is bleeding, he applies a Mikulicz or Hurd tonsillar hæmostat, and should it continue he fills the tonsillar fossa with gauze wet with **Gallic** and **Tannic Acids,** and then sutures the pillars with Mikulicz metal clamps. Burack[16] reports three dangerous hæmorrhages in 2000 operations. These were stopped by Mikulicz compressors, digital compression, or the fainting of the patient. Williard[17] has had a case of fatal hæmorrhage in a child six years of age, apparently in good condition at the time of operation. There was no immediate bleeding of any kind, but two hours afterwards vomiting and bleeding set in. The bleeding point could not be found. Every method was used to check it, and it stopped in eight hours, but the child did not survive the shock, and died the next day. The mother proved to be a bleeder. Theisen[18] advocates the use of **Diphtheria Antitoxin** in severe hæmorrhage ; 5,000 to 10,000 units. For nasal hæmorrhage he uses 10 c.c. of **Normal Horse Serum** from the horse. In one of his cases of hæmorrhage he also used 20 c.c. of antistreptococcal serum.

Sheedy[19] reports four cases of *death following the use of cocaine and adrenalin solutions* for local anæsthesia in tonsillectomy, showing the great danger involved in the use of such solutions when injected into the soft tissue surrounding the tonsils. When local anæsthesia is desired, cocaine must be applied to the surface only, and not injected. To attain a sufficient degree of local anæsthesia for the operation, the author suggests the use of a 5 per cent solution of **Bisulphate of Quinine.** There has been no pain in the cases in which the solution was deposited outside the capsule of the tonsil, and into the tissue forming its bed. Half a drachm of solution is introduced by means of a 1-oz. piston syringe outside the border of the anterior pillar, and the same amount at a point opposite, between the capsule and posterior pillar. Enucleation can begin as soon as the solution is injected ; there is no need to wait as when cocaine is used. The patient, who needs no preparation, sits upright in the chair with the head properly supported.

End-Results.—Hayes[20] has had a case of petit mal in a child of six years, cease after the removal of tonsils and adenoids. Lothrop[21] gives the data of sixty-one cases of tonsillectomy, one to three years, after operation. Ninety-one per cent showed improvement, 16 per cent had had some sore throat since operation, and in most of these some residual tonsillar tissue could be demonstrated. Of 1700 cases operated on in three years, only two required suturing of the pillars, and in a third it was done as a precautionary measure.

Makuen[22] considers that the normal tonsil is beneficial to voice production, as it improves the resonance of the voice, and by keeping the pillars apart gives direction to their action in voice production. The soft palate has two important vocal functions : the first a valvular action markedly affecting vocal resonance, and the other a thyroid-tilting and cord-stretching function affecting the quality and pitch of the voice. Large tonsils interfere with the mobility of these muscles, and when the conditions are particularly marked the palatal valve fails to close, leaving the oropharynx open and giving the voice a faulty resonance. At the same time the palato-pharyngeal muscles, having lost their anchorage in the vault, fail to perform their thyroid-tilting and cord-stretching function. A careless and too radical operation, instead of improving, may do great harm to the voice. The danger of interference with the action of the palatal and lingual muscles by contractions and adhesions following even skilfully performed operations, is the great objection to the total enucleation of the tonsil. It is unusual to find the pillars of the palate entirely free after total enucleation, and it is probably owing to this that injuries to the voice have been so numerous.

The best results so far as voice is concerned would be after an intracapsular operation, whereby all the tonsil tissue is removed, but the capsule is left with its attachments to the pillars. The two important indications for the removal of the tonsil are to get rid of foci of infection and to restore the functional efficiency of the respiratory, phonatory, and articular organs, and any operation which does not meet these conditions is more or less of a failure. The popular belief that the removal of the tonsils injures the voice is well founded, and is due in large measure to careless or bad surgery. Ritchie[23] takes an entirely different view, and says tonsillectomy often improves the voice, an opinion with which the reviewer, having carefully examined many of his own cases some months or years after operation, would agree.

Primary Syphilis of Tonsil.—Thrasher[24] finds chancre of the tonsil present in about 20 per cent of the extra-genital lesions. The causal virus is most frequently conveyed by kissing, although infection may be attributed to the use of unclean eating or drinking utensils. Infection by perverse sexual intercourse is rare. The tonsil of a primary luetic infection appears red and swollen, with a grey ulcer upon it, surrounded by a zone of indurated tissue. The chancre is usually confined to one tonsil, and is accompanied by marked cervical adenitis, and by pain in deglutition or on pressure. If the case is seen before the presence of constitutional involvement, radical tonsillectomy may remove the entire contagion.

Malignant Growths.—Matthews finds tumours of the tonsil more prevalent in the male sex, appearing usually after the fortieth year. Sarcoma appears encapsulated, the capsule of the tonsil resembling that of the tumour. Accurate diagnosis is obtained only by clinical signs and symptoms. Carcinoma of the tonsil is usually of an epitheliomatous type, with pain, ulceration, and dysphagia as early symptoms,

while sarcoma becomes a large mass without ulceration, and is first noticed on account of its size and the difficulty in swallowing. The treatment is indicated by microscopic examination of frozen sections. In children, palliative treatment is the only method that gives relief. The author reports twenty cases of sarcoma and three of carcinoma, treated by tonsillotomy and tonsillectomy, in all of which there was recurrence within two years. One case of carcinoma was free from recurrence for three years after tonsillectomy, with the cautery. Jacobson reports a case treated thus without recurrence for eleven years. The prognosis of cases requiring the splitting of the cheek is unfavourable, on account of the nature and extensiveness of the growth demanding this method of operation. The most radical and efficient operation is by lateral and external pharyngotomy, in which the entire pharyngeal growth is removed with the cervical glands *en bloc*. The *x*-rays and the use of Coley's toxin give relief from pain, and perhaps check the rapidity of the growth, although the best medical treatment consists in keeping the diseased areas clean and in reducing the pain.

Tuberculosis.—Sewall[25] reports on the laboratory examination of 772 pairs of tonsils. Thirty pairs of these were pronounced tuberculous. He also reports 160 cases of removal of tonsils for enlarged glands which had been operated upon during the previous five years. At the time of examination, 92 had no enlarged glands ; 68 had more or less enlarged glands ; 67 had permanently subsided ; 6 subsided and then became enlarged again ; 7 remained unchanged : practically all of the glands giving trouble have been associated with tuberculous tonsils. The removal of the tonsils works in a beneficent manner, although the swollen tuberculous glands do not always permanently subside. Some such glands are not associated with tuberculous tonsils, and as tuberculosis is commoner in the glands than in the tonsils, he believes that the bacilli can travel to the former without damage to the latter. The general health of the individual is improved after the removal of the tonsils.

References.—[1]*Ann. Otol.* 1911, Sept. ; [2]*Ibid.* 1912, June ; [3]*Bost. Med. & Surg. Jour.* 1911, Mar. 2 ; [4]*Wien. klin. Woch.* 1912, Jan. ; [5]*Jour. Amer. Med. Assoc.* 1911, July 29 ; [6]*Brit. Med. Jour.* 1911, Nov., and *Lancet*, 1910, Sept. 17 ; [7]*Jour. Amer. Med. Assoc.* 1912, Jan. ; [8]*Ind. Med. Gaz.* 1912, Jan. ; [9]*Brit. Med. Jour.* 1911, *Dec.* ; [10]*Ibid.* ; [11]*Edin. Med. Jour.* 1912, Sept. ; [12]*Jour. Laryngol.* 1911, Sept. 11 ; [13]*Laryngoscope*, 1912, May ; [14]*Ann. Otol.* 1911, Sept. ; [15]*Med. Rec.* 1912, June ; [16]*Z. Laryng. Rhinol. u. e. Grenzgeb.* [17]*Jour. Opt. Otol. & Rhin.* 1911, Feb. ; [18]*Ann. Otol.* 1911, Sept. ; [19]*Med. Rec.* 1911, Oct. ; [20]*Ann. Otol.* 1911, Sept. ; [21]*Bost. Med. & Surg. Jour.* 1911, Aug. ; [22]*N.Y. Med. Jour.* 1911, Aug. 5 ; [23]*Pa. Med. Jour.* 1911, Feb. ; [24]*Laryngoscope*, 1911, Nov. ; [25]*Jour. Amer. Med. Assoc.* 1911, Sept.

TORTICOLLIS. *Purves Stewart, M.D., F.R.C.P.*

Wry-neck, Fixed or Congenital, must be carefully distinguished from spasmodic wry-neck, which is due to active spasm, tonic or clonic, of the cervical muscles. Congenital wry-neck, on the other hand, is due to shortening of some muscle, generally the sternomastoid, resulting from cicatricial contraction following an injury to this muscle

MECHANO-THERAPEUTIC TREATMENT OF TORTICOLLIS

Fig. A.—Showing position of operator and patient in the resisted exercise for the weakened right sternomastoid.

Fig. B.—Showing position at commencement of the resisted exercise for the muscles that rotate the head to the right.

Fig. C.—Showing position for the final stage of the resisted exercise for weakened left flexors of head.

Fig. D.—Showing the grasp of the patient head (*see Figs.* A and B) from the lateral aspec

Illustrations by E. F. Cyriax, of Kellgren's Method of Treatment.

Photographs kindly lent by the Author.

during birth. As a result, the head deviates slightly to one side, and cannot be turned either actively or passively towards the side of the contracted sternomastoid. The condition is chronic and painless, and we are usually consulted simply on account of the deformity.

TREATMENT.—It may be necessary in severe cases to **Divide the Tendon** of the contracted sternomastoid. In milder cases **Massage** and **Manipulation** may be found sufficient, without surgical interference.

Cyriax[1] gives a careful description of Kellgren's **Mechano-therapeutic** method (*Plate XLI*). The deformity results from one muscle or group of muscles being stronger than its antagonists, this increase in strength being absolute as well as relative. It is accompanied by increase in the tonus of the stronger muscle or muscles. Dis-equilibrium of muscular antagonism is the result. In every case the object of mechanotherapy is to restore the equilibrium, whether such treatment be prescribed either by itself without operation, or as a pre- or post-operative measure. How can the muscular equilibrium be restored in a physiologically correct manner? The reply is: By increasing the power of the weakened antagonists until they become as strong as the contracted opponents, or even by over-correction, so that the weakened antagonists become ultimately the stronger group.

The exercises for the muscles of the neck are divided into five groups.

1. *Resisted Exercises for the weakened Muscles.*—In order to give the weakened muscle the best chance of contracting, it should be elongated as much as possible within physiological limits, for the greater the absolute length of a muscle, within such limits, the greater will be its absolute power. Not only this, but the elongation of the weakened muscle will also diminish the tonus of the contracted muscle directly through absolute shortening, as well as reflexly, owing to the physiological principle that activity in a muscle inhibits the tonus of its antagonists. The way to elongate the weakened muscle is simply to increase passively the deformity. For example, suppose a case of wry-neck in which the left sternomastoid muscle is in a state of contraction, the corresponding muscle on the right side being weaker. The effect of the pathological contraction is to bend the patient's head to the left, to turn the chin upwards, and to rotate it to the right, so that the face looks upward and to the right. The operator proceeds to increase the tension in the right sternomastoid by passively increasing the deformity, i.e., by flexing the head still more to the left, extending it still further backwards, and rotating it still more to the right. Meanwhile he passively lifts the head away from the trunk in the direction of the component of the three above-mentioned movements. This having been done to the maximum physiological limit, the result is that the right sternomastoid (the weakened one) is passively elongated to its maximum, whilst the left sternomastoid (the contracted one) is passively shortened to its greatest extent. Then the patient is directed to turn his head actively in the reverse direction, i.e., he must flex the head to the right, flex the chin forwards, and rotate it to the left. By this means he puts into action the weakened right sternomastoid.

During the patient's efforts the operator applies just so much resistance as can be overcome by the efforts of the former. The patient continues the active movement until at last the contraction of the right muscle is equal to the pull of the left. By this time the operator's resistance, which has been gradually diminished, has been reduced to nil. Further continuation of the movement, however, is rendered possible by the operator passively stretching the left sternomastoid while the patient tries to contract the right muscle still further, i.e., the final stage of the movement is done with assistance. The aim of this assistance is to obtain the maximum amount of active shortening in the right sternomastoid. Moreover, although the muscle could not, unaided, contract so as to assume that position, yet when placed therein it can offer considerable resistance to an opposing force. This fact is utilized in the next stage of the exercise, viz., the reverse movement back to the original position, which is now performed by the operator, the patient resisting meanwhile.

The effects of the foregoing exercise are that the weakened right sternomastoid will have its circulation promoted, its tonus and absolute power increased, and its voluntary contraction rendered more rapid ; while the contracted left sternomastoid will have its relative power and its tonus diminished, and it will be submitted to an ever-increasing stretching force, as the right muscle increases in strength. In other words, the tendency is for the right muscle to increase and the left muscle to decrease in strength ; thereby muscular equilibrium tends to be restored. Cyriax emphasizes the fact that to apply resisted movements to the contracted left sternomastoid is exactly what should not be done, inasmuch as this will further increase the strength of the contracted muscle, thereby aggravating the deformity.

2. *Manual Stimulation of the Nerves of supply of the Weakened Muscles.* This is done by so-called nerve friction. The nerve-trunk is first of all located by anatomical landmarks. Any muscles overlying the nerve must be uncontracted and relaxed. The finger-tips are then placed on one side of the nerve, as much as possible at right angles to its long axis. The finger-tips and intervening structures are then drawn sharply across the nerve, the amount of pressure meanwhile being increased. This is repeated several times, and each time the nerve in question is mechanically stimulated. Thus, in the case of contraction of one sternomastoid, such frictions are applied over the spinal accessory nerve before it has entered the muscle on its anterior border.

3. *Purely Active Movements for the Weakened Muscles.*—By these are meant voluntary movements by the patient without external aid or resistance. These are not to be practised except in conjunction with resisted exercises, for by themselves they accomplish but little. In a case of contraction of the left sternomastoid, the patient stands in front of a looking-glass and endeavours by his own unaided efforts to correct the deformity by voluntarily contracting the right sternomastoid.

4. *Pétrissage, Frictions, etc., of the Weakened Muscles.*—These manipulations are employed to induce contraction of the muscle. They are to be applied for a few seconds at a time, shortly and sharply. Their beneficial effect is comparatively little compared with that of resisted movements, but they may be employed in order to induce a preliminary stimulation before attempting the resisted movements.

5. *Passive Stretching of the Contracted Muscles.*—This may be applied in order to break down adhesions, etc., but otherwise should be employed only during the actual performance of resisted exercises for the weakened antagonists, or as a preliminary to the latter. It should not be employed alone to the exclusion of the latter, otherwise the effect will be nil, or possibly even detrimental.

REFERENCE.—[1]*N.Y. Med. Jour.* 1912, i, 1032.

TRANSFUSION. *Herbert French, M.D., F.R.C.P.*

An ingenious appliance for direct transfusion is described by A. L. Soresi,[1] but it requires a rather elaborate surgical technique. A. M. Curtis and V. C. David[2] also have designed a special apparatus for this purpose.

E. H. Risley and F. C. Irving[3] have made use of a large number of different devices in order to test which is the most useful in practice, and whereas they have much to say in favour of the ingenious device of David and Curtis mentioned above, especially in regard to the possibilities of actual measurement of the amount of blood transfused by it, they conclude that the simplest, safest, and most efficacious technique consists in using plain glass tubes, which may be of various sizes and shapes, and which should be coated with paraffin.

They do not hesitate to recommend them as being far ahead of any of the other more complicated apparatus proposed, but also by far the most satisfactory for all-round transfusion work, both for adults and infants, and for the experienced as well as the inexperienced operator. A nest of tubes can be blown in a very short time by anyone used to glass-blowing, or even by the inexperienced; the paraffin mixture, which consists of paraffin two parts, petrolatum two parts, and stearin one part, can be obtained easily, and if this, with the tubes, is kept in a small copper box, the tubes can always be available.

When it is desired to use them, the tubes may be boiled up with the operator's instruments in a separate cloth; the paraffin is next heated to boiling in the copper box over a flame, and the tubes are dipped into the hot paraffin and taken out with forceps, the excess of paraffin being run off, thus coating them very thinly, both inside and out. Any excess left at the end of the tube is touched off with sterile gauze, and the tube is then ready for use. This particular paraffin mixture does not fleck off or crack, and blood can be run through it for at least one half-hour without any signs of clotting. After using, the tubes are easily cleaned by boiling and shaking out the excess of

paraffin over a flame. *Fig.* 103 shows the variety and actual sizes of tubes used, the longer and smaller calibre tubes being more desirable for infant work. (Admirably described by Vincent in *American Journal of Diseases of Children*, 1911, I, 376.)

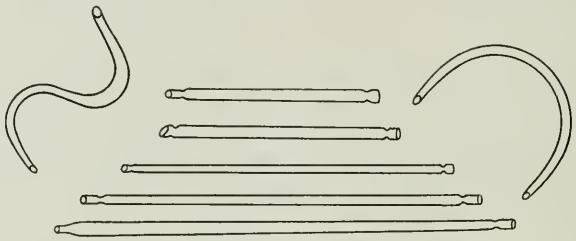


Fig. 103.—Paraffin-coated glass tubes for transfusion.

A somewhat similar cannula is described by M. Tuffier,[4] who is an equally strong advocate of vein-to-vein transfusion by means of paraffin-coated tubes. His paper is illustrated by diagrams of the apparatus he uses, and of the different stages of the operation.

REFERENCES.—[1]*Med. Rec.* 1912, i, 835; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 1453; [3]*Bost. Med. and Surg. Jour.* 1912, i, 956; [4]*Presse Méd.* 1912, 641.

TRICHINIASIS. *Herbert French, M.D., F.R.C.P.*

DIAGNOSIS.—The most certain way of diagnosing trichiniasis is, probably, by excision of small portions of the infected muscles and the discovery of the *Trichinella spiralis* in situ. Sometimes this is not possible, and it is worth knowing that another means of establishing the diagnosis is to search for and discover the trichinella embryos in the patient's blood. Successful cases are recorded by A. R. Lamb.[1]

Stüabli's original method of diluting the blood with ten volumes of 3 per cent acetic acid was used, the only modification being that, in several instances, the blood was obtained from the blood cultures taken from the patients. These cultures were the usual routine ones used in the hospital, 10 c.c. of blood being divided between two Erlenmeyer flasks of meat infusion broth. After the culture had been reported sterile, the clear supernatant broth was decanted, and ten volumes of 3 per cent acetic acid were added to the sediment. The mixture was thoroughly shaken, centrifuged, and the supernatant fluid poured off. If the resulting sediment was too thick, the laking with the acid was continued until a sediment was obtained in which the search was unhampered by the presence of countless numbers of blood-cells. A drop of the sediment was then poured on to a large slide, covered with a good-sized cover-slip, and systematically searched with a low-power lens.

The embryos appear as distinct, cylindrical, generally slightly curved little worms, with a refractile outline and a characteristic granular internal structure. Both ends are somewhat rounded, the anterior

a little narrower than the rest of the body, and terminating in a little clear homogeneous cap.

The technique of the examination is very simple. While the search for the embryos is tedious, it is scarcely more so than the examination of the blood for the plasmodium of malaria.

The earliest time at which they may be found in the blood is on the sixth or seventh day after infection. The latest date is not so accurately fixed. While the parasites have not been found later than the twenty-seventh day after infection in guinea-pigs, or later than the twenty-second day after the onset of symptoms in man, there is some ground for the belief that they may occasionally be recovered in the fifth or possibly the sixth week after infection.

This method is of greatest value in those cases where the diagnosis is doubtful, and especially where the patient refuses permission to excise a piece of muscle, or where the muscle findings are negative.

REFERENCE.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 395.

TRYPANOSOMIASIS. *Leonard Rogers, M.D., F.R.C.P.*

D. Bruce, A. E. Hamerton, H. R. Bateman and F. P. Mackie[1] publish a further paper on trypanosome diseases of domestic animals in Uganda, and record the discovery of a trypanosome in the Uganda ox which is identical with *T. Brucei* of "nagana" in Zululand and South Africa. They found it to resemble *T. dimorphon* of Dutton and Todd so closely that they raise the question whether the two are identical.

C. Schilling[2] gives a useful summary of recent knowledge of sleeping sickness, which is noteworthy for its appreciation of the researches of English workers. He lays especial stress on the importance of the detection of human carriers by gland palpation and punctures. Andrew Balfour[3] describes a gland holder for fixing lymphatic glands while they are being punctured, and also suggests a fly-trap baited with blood or fresh antelope flesh, but has not yet tested his idea. He also mentions a native trap made of a gourd containing blood, used to catch tsetse flies with which to infect their enemies' cattle.

P. H. Macdonald[4] deals with sleeping sickness in Gambia, where it is now much less prevalent than it was not many years ago, forming probably not more than 1 per cent of all diseases. He has seen only two cases in Europeans, in whom the disease is more rapid than in natives. Tsetse flies abound in the country.

TREATMENT.—H. A. Foy[5] publishes a third report on experimental animal trypanosomiasis in South Bornu, and concludes that in the disease of horses intravenous injections of methylene blue are useless, perchloride of mercury by itself has only a temporary beneficial effect, but that gr. 3 of **Arsenic,** three times a day, combined with 1 oz. of a ·1 per cent solution of **Perchloride of Mercury,** three times a day by the mouth, has both a curative and a prophylactic action. The serum of a cured or a naturally immune animal has no efficacy.

H. Braun and E. Teichmann[6] have studied the action of injections

of vaccines prepared from cultures of trypanosomes by drying the dead organisms and carbolizing them, and succeeded in producing a certain amount of active immunity, which in guinea-pigs and rabbits lasted several weeks. Mice immunized against dourine were permanently protected against that organism and also against nagana and mal de caderas strains. They support Ehrlich's results that mice immunized against serum-tolerant strains do not protect against original strains, and vice versa. By treating rabbits with trypanosome vaccine, highly active sera were obtained, but the activity of the serum differed materially in test-tube experiments from that obtained in animal experiments.

L. Breiger and M. Krause[7] have been experimenting with the **Safranin** group in the treatment of sleeping sickness. One gram a day can be given, and they find it is harmless to man, and promises well. They[8] have discovered a chemical substance, provisionally named **Trypasafrol,** prepared from a series of substances they have been experimenting with, which are related to the dyes and are non-poisonous to man in large doses. They are quite free from arsenic, showing that it is not necessary to link an organic molecule to arsenic in order to get a trypanocidal effect. They have been using this substance in cases of rats infected with *T. Brucei* with very good results, while it has a marked effect in destroying that parasite when given by the mouth, and does not readily deteriorate.

C. N. B. Camac[9] records in great detail the first case of human trypanosomiasis yet studied in America. After prolonged treatment with **Atoxyl** and **Antimony,** the patient has now been free from fever for two years, and promises to recover completely.

References.—[1]*Jour. R.A.M.C.* 1911, ii, 327; [2]*Berl. klin. Woch.* 1912, Jan. 13; [3]*Brit. Med. Jour.* 1912, July 10; [4]*Jour. Trop. Med. & Hyg.* 1912, 113; [5]*Ibid.* 1912, 301; [6]*Deut. med. Woch.* 1912, 107; [7]*Berl. klin. Woch.* 1912, 13; [8]*Ibid.* 1453; [9]*Amer. Jour. Med. Sci.* 1911, ii, 658.

TUBERCLE BACILLI. (*See* Sputum, Examination of.)

TUBERCULOSIS IN CHILDREN. *Frederick Langmead, M.D., M.R.C.P.*

Prevalence.—Some believe that children are almost universally affected with tuberculosis, and that the disease which occurs in adults or adolescents dates from childhood in the vast majority of cases. Koplik[1] takes this view. According to this author, it cannot be said that infants or children are predisposed to tuberculosis, but that given an exposure to infection they will contract it; also that they are in a position to be exposed more than anyone else, for they crawl along the floor and put all things in their mouths. Among the poor, they are crowded in with the phthisical, whose playthings and helpmates they are. The infective agent may pass from the blood of the mother into the body of the fœtus, which may be born tuberculous and harbour tubercle bacilli, and yet manifest no sign or symptom. Up to the second year, the incidence of active tuberculosis is less than at any other period. From this time onwards the percentage of tuberculous

children increases until the fourteenth year. According to Hamburger, the greatest incidence occurs at the fourth to sixth year of life.

The chief *methods* by which the frequency of tuberculosis can be estimated are by autopsy and by the recent bacteriological tests. Koplik quotes among others the important statistics of Ghon, from Vienna. Of 848 autopsies, in 4 per cent of those on children under three months, tuberculosis was found, and from this age onwards the percentage gradually increased until it reached 70 per cent in children eleven to fourteen years old. Von Pirquet, using his test, found that 55 per cent of the children who attended the clinic for diseases other than tuberculous, gave a positive reaction, whilst Hamburger, who took the negative cases of von Pirquet and injected them with tuberculin subcutaneously, found that between the twelfth and thirteenth years of life, fully 95 per cent were infected with tuberculosis.

McNeil[2] quotes figures from the autopsies of four widely separated European capitals. In Christiania, tuberculous lesions were found in 42·5 per cent of all children examined *post mortem* (Harbitz); in Vienna, in 40 per cent (Hamburger and Sluka); in Paris, in 38·5 per cent (Comby), and in London in 35 per cent (Still). He used von Pirquet's test in order to discover the prevalence of tubercle at different ages. The test was performed in 541 cases in all; 371 hospital cases at Edinburgh, the age-periods ranging from birth up to twelve years, and 170 cases from a boy's industrial school. The ages of the latter group ranged from six to sixteen years, the majority being ten years or more. These boys were drawn from the very poorest. Very little active tuberculosis occurred at the school, so that any positive reactions indicated latent rather than apparent tuberculosis, and remote rather than recent infection. The results are as follows: Among the hospital cases, 37·7 per cent positive; among the industrial-school cases, 59·4 per cent positive. An investigation into the age-periods of the hospital cases suggested that tuberculous infection is already apparent as a chronic process during the first year of life; it rapidly increases, and practically reaches a maximum during the fourth or fifth year. The great proportion of tuberculous infection is effected in the first five years of life. These figures differ from the Continental statistics in the heavier incidence of tuberculous infection in infancy, and in the attainment of the maximum at an earlier period. Thomson and Fordyce show that abdominal tuberculosis is clinically much commoner in British children than in those of certain other countries, and in Britain reaches its maximum in Edinburgh and Glasgow. McNeil thinks that this greater prevalence of abdominal tuberculosis in Edinburgh, coupled with its earlier incidence and the low adult death-rate from tuberculosis in that city, means that the infection is largely bovine, from tuberculous milk. On the other hand, Koplik (*loc. cit.*), speaking of American cases, says that bovine tuberculosis from milk cannot form over 1 to 2 per cent at most.

Special Features.—As Koplik (*loc. cit.*) points out, tuberculosis in infancy and childhood is associated particularly with the lymphatic

glands, especially those of the lung. He states that they are tuberculous in fully 80 to 90 per cent of all cases. In Vienna, Ghon found that in 98 per cent of autopsies on tuberculous children, the pulmonary glands were diseased. When involved, a primary focus in the lung could always be demonstrated. Primary tuberculosis of the tonsils is rare at this age. Meningitis is of far greater frequency than in adults. The infrequency of cavities of the lung in children as compared with adults has often been remarked upon, and, as Koplik mentions, may be explained by the more acute course which tuberculosis runs in early life, so that there is no time for excavation to occur.

The course of the tuberculous process under the fifth year of life is acute, and even in pulmonary cases the duration is comparatively short. In the nursing infant, the symptoms are often obscure, and become evident only in the final stage. Koplik believes that a remittent fever, varying from half to one or more degrees above normal daily for weeks or months, is characteristic of some forms of tuberculosis in infancy and childhood. The initial period of the disease, however, may be apyrexial. Of 209 cases under his care, tuberculous meningitis accounted for 158 cases, pleurisy for twenty-three, tuberculosis of the lung for seventeen, of the peritoneum for eight, and of the other organs for three. [These apparently do not include surgical forms. —F. L.) Thus cases of tuberculous meningitis formed 75 per cent of the whole, and of these quite 80 per cent occurred before the fifth year.

Koplik favours the retention of the term "scrofulosis," as descriptive of a form of tuberculosis which affects children with a "lymphatic constitution." Such children have large tonsils, adenoids, enlarged lymphatic glands throughout the body, and hyperplasia of the mucous membranes. The solitary follicles are enlarged for the whole extent of the small and large gut. The thymus gland is also large. The children are pasty, anæmic, and suffer from catarrhs of the mucous membranes. They often have cyclical albuminuria. The lesions which contribute to the clinical picture are: tuberculous adenitis; catarrhal states of the conjunctivæ, nose, and respiratory tract; tuberculous disease of the bones and spine; osteomyelitis of the long and flat bones, including those of the skull; manifestations on the skin in the form of lupus, ecthyma, and tuberculides; and all affections of the cornea and lens of the eye. He suggests this condition is the result of repeated infections with small numbers of tubercle bacilli, so that there is developed an active immunity against the disease, which holds it in check and increases its chronicity.

Diagnosis.—Koplik (*loc. cit.*) mentions the difficulty of diagnosis between tuberculous meningitis and encephalitis. As a means of distinguishing them, he lays stress on the value of a study of the fluid removed by lumbar puncture. In tuberculous meningitis, there is a greater preponderance of mononuclear cells, and tubercle bacilli can nearly always be found.

Later in childhood, the acute miliary form often causes much uncertainty. The temperature ranges high (from 103–105° F.), and the mind is clear for two or three weeks. Such cases cannot be distinguished from other forms of continued fever, such as typhoid fever, until the terminal stage. Not only the von Pirquet but the Widal reaction often mislead in such cases. In distinguishing between bronchopneumonia and tuberculosis of the lungs in children, in addition to the usual guides (persistence in the temperature, localization at the apices, absence of resolution, emaciation, and cyanosis), he mentions a rasping metallic cough and so-called expiratory dyspnœa, as indications of the tuberculous nature of the lesion.

He regards as tuberculous a pleurisy, the onset of which is not "stormy" though it may be acute, in which the temperature is not very high, the fluid clear and free from organisms, the weight and strength failing, a history of tuberculosis in the vicinity of the patient, and the tuberculin tests positive. He does not agree that nearly all pleurisies are tuberculous, but thinks 50 per cent nearer the truth.

Theodore Fisher[3] mentions a form of bronchial dilatation in children which is often mistaken for pulmonary tuberculosis. He believes that the bronchopneumonia associated with measles leads to dilatation of the bronchi much more often than to tuberculosis. The dilatation may be limited to the apex and may give signs suggesting a large cavity, or no abnormal signs may be heard beyond an abnormally weak inspiratory murmur. Rare though this lesion is, he considers it commoner in children than chronic tuberculosis of the lungs.

Of the various *tuberculin reactions* used in the diagnosis of tuberculosis in children, the method which has found most general acceptance is that of von Pirquet. When it is remembered that according to von Pirquet himself, 55 per cent of all children between the ages of ten and fourteen give a positive reaction, or in other words have a focus of tubercle, it is clear that as a means of attributing any particular illness to tubercle, it lacks precision. It must therefore be considered in close association with the clinical symptoms and signs. As Koplik mentions, it is often negative in the later stages of meningitis and lung tuberculosis, and also in advanced miliary tuberculosis of the peritoneum. McNeil (*loc. cit.*) says that its value may be enhanced if performed thus: A small circular area of epidermis is chafed off with the point of a needle, care being taken to avoid bleeding. On this denuded area, the head of a darning-needle charged with undiluted old tuberculin is pressed with a rotatory movement, forming a small bruised pit from which the fluid is rapidly absorbed. This method differs from that employed by von Pirquet only in the preliminary removal of the epidermis.

Others prefer the subcutaneous or "stich" reaction of Escherich and Hamburger, claiming that it is more reliable, positive in earlier cases, and more easily recognized. Koplik utters a warning against its use in cases in which tuberculous pleurisy is probably present. In two such cases, the injection was followed by a recrudescence of the symptoms and an increase in the pleural effusion.

Another modern method of diagnosis is *radiography*. Koplik thinks that *x*-rays are of value for the demonstration of enlarged mediastinal glands and of miliary foci in the lungs. Like many other observers, he has frequently been able to demonstrate during life the presence of large glands at the root of the lungs, and of miliary foci in the lungs in cases of meningitis and pulmonary tuberculosis in infants and young children.

TREATMENT.—All agree that the most important treatment is *preventive*, i.e., early notification, and adequate supervision of the patient and his surroundings. Koplik goes so far as to recommend the separation of infants and children from the vicinity of infection, and if necessary from their parents.

Tuberculin is more useful in surgical forms of tuberculosis in children than in those which are medical, for the latter are often acute, febrile, and general, conditions in which vaccine therapy has a limited field of usefulness.

McNeil suggests that the cutaneous reaction may afford a guide as to the dose which should be employed. White and Graham in chronic afebrile cases used doses which produced a mild reaction, and smaller doses in febrile cases. They met with encouraging results, in a limited series of cases. Raw has advocated the use of bovine tuberculin in cases of pulmonary tuberculosis, but as far as is known at present, the human form is perhaps slightly more potent than the bovine in producing a reaction in the body of man, whether harbouring a bovine or a human strain of the bacillus.

REFERENCES.—[1]*Johns Hop. Hosp. Bull.* 1912, 113; [2]*Edin. Med. Jour.* 1912, i, 324; [3]*Clin. Jour.* 1912, 410.

TUBERCULOSIS, ILEOCÆCAL. (*See* INTESTINAL SURGERY.)

TUBERCULOSIS, INTESTINAL.

(*Vol.* 1912, *p.* 16)—**Glutannin** is a useful astringent in this disease. It is given by the mouth, in tablets.

TUBERCULOSIS, PULMONARY. (*See* also HÆMOPTYSIS, NON-TUBERCULOUS; LUNG, SURGERY OF.) *J. J. Perkins, M.B., F.R.C.P.*

DIAGNOSIS.—Lawrason Brown,[1] discussing the value of the *tuberculin tests*, concludes that they are specific, only those subjects who are tuberculous reacting to tuberculin. Only last year, he says, reports have been published showing that infants apparently healthy fail to react even to such large doses as 1000 mgrams repeatedly given. He discredits all the reports which show that other diseases (with the possible exception of leprosy) react specifically to tuberculin, preferring to believe that the reported cases are in reality instances of double infection. As regards the dangers of the various tests employed, he says that the conjunctival test has given rise to a number of unfortunate accidents, and that it should be avoided in children. If all patients, however, who have ever had the slightest trouble with their eyes are

excluded, and only 1 and 5 per cent solutions of the old tuberculin used, the test is comparatively safe.

The dangers of the cutaneous tests are so slight as to warrant no consideration except in scrofulous children.

The subcutaneous tests, to be positive, demand a general reaction which may be for the time unpleasant, but only in a few instances has he seen a slight rise of temperature persist. The occurrence of tubercle bacilli in the expectoration after the injection of tuberculin he believes to be a coincidence ; an increase of physical signs in the lungs occurred in about 40 per cent of the patients who were tested in this way, but only in a few instances did this persist. As regards the value of the tests, he has come to believe that failure to react even to 10 mgrams of old tuberculin given subcutaneously does not necessarily exclude clinical tuberculosis, while reaction to a much smaller dose need only indicate the presence of those minor tuberculous foci which are so common, if indeed not universal, among adults. The cutaneous test, he holds, is valueless after seven or eight years of age, and the negative skin reaction in his experience does not exclude tuberculosis, as he knows tuberculous patients in good condition who have failed to react to old tuberculin in full strength. Summing up, he says that in practice, exposure to infection, characteristic symptoms, such as hæmoptysis and persistent localized signs at one apex, are diagnostic data of far more importance than those derived from the tuberculin tests. A positive reaction is of uncertain value unless the pulmonary symptoms or signs are definitely increased during the reaction : a negative reaction is of uncertain value, and in the face of positive symptoms carries very little weight. In many instances the tuberculin test adds only confusion to the clinical data, and none of the devised tuberculin tests clearly differentiate clinical tuberculosis from what Lawrason Brown calls non-clinical tuberculosis, which, as he puts it, demands not vigorous treatment but a God-fearing life.

Harrison Orton,[2] in an address delivered before the Medical Society of London, adduced evidence of the possibility of diagnosis by means of the *x*-rays in cases of pulmonary tuberculosis at too early a stage to be detected by the ordinary clinical methods. In this opinion he was supported by Mitchell Bruce and others. Bruce instanced hæmoptysis without physical signs, and cases of uncertain signs distributed throughout the lungs which could not definitely be declared to be those of tuberculosis. In addition to these cases, Orton said that his experience had shown him that there were cases which could advance to such a stage as to give marked shadows in both lungs before there were any ordinary physical signs, and lastly that he had come across quite a few cases in which the physical signs were suggestive of tubercle but the *x*-ray res ·lt was negative. The points to observe for an *x*-ray diagnosis in the case of very early disease are quite slight and need skill on the part of the observer and a very careful technique. They comprise dimness of one apex or both, with failure to brighten on deep inspiration ; or again, a restricted movement of the diaphragm on the affected

side. It is interesting to note that the use of the *x*-rays is bringing us back to the position held by Brehmer, which was the foundation of his system of graduated exercise, that the heart in tuberculosis, i.e., in the early stage, before hypertrophy has taken place, is much smaller than normal.

Jordan[3] holds that so far from commencing at or just below the apices of the lungs, the disease much more frequently originates at the roots and extends along the branches of the larger bronchial tubes. In 150 consecutive *x*-ray examinations the disease was found to be purely apical in thirty-two cases only; in fifty-nine cases it was confined to the region of the roots, while in other fifty-nine it affected both apices and roots as well. The shadows radiating from the hilus, which are indicative of this condition, he found to be caused by an increase of fibrous tissue around the bronchial cartilages. Giant-cell systems were found in some cases, showing that active tuberculous disease was in progress. He reaches the conclusion that peribronchial phthisis is a condition of great clinical importance, not only on account of its frequency, but because it may reach an advanced stage without revealing any signs of its presence through the usual methods of physical examination of the chest. The only known method of making an early diagnosis in such cases is by means of the Röntgen ray.

TREATMENT. — **Radio-active Iodine Menthol.** — Robinson[4] ascribes the action of this body to the volatility of radium, which is slowly eliminated, as is known, by way of the lungs, the helium being fixed at the edge of the tubercles. According to Bernheim this radio-activity neutralizes the virulence of the bacilli and paralyzes the harmful influence of the toxins. Szendeffy, the discoverer of this chemical product, showed that it had the power of arresting *in vitro* the development of the most virulent c ltures of the tubercle bacillus, and of staying the course of tuberculosis in animals experimentally infected. For example, in one series of experiments, guinea-pigs inoculated with tubercle died in from four to ten weeks from tuberculosis, while those which, inoculated in the same way, also received injections of 3 cgrams of the iodine and menthol solution every other day, were cured of their ulcerations fairly rapidly, and six months later were still alive.

The composition of the anti-bacillary product is stated to be the following: peptonized iodine 0·75 cgram, menthol 0·06 cgram, radium barium chloride one-tenth of a drop in ethereal solution.

A dose of a cubic centimetre (16·9 min. nearly) should be injected once a day during ten consecutive days; then one injection every second day until the tenth, and after a rest of a week or two, a series of forty is carried out. Three or four series of injections may be made. The treatment is most suited for subjects who are only slightly attacked —in the first or second stages of the disease. (*See also page* 13.)

Mitchell[5] records the results of his experience with **Marmorek's Serum,** of which many foreign observers have spoken very highly.

The method employed was to give 2·5 c.c. hypodermically until anaphylaxis was seen, and then to give 5 c.c. daily by rectal injections for fourteen to twenty-one days. An interval of seven to ten days without treatment was followed by another series of daily injections for fourteen to twenty-one days. This routine was carried on as long as the case demanded. Many of those treated were in an advanced stage of the disease, when too much could not be expected from any mode of treatment, but certainly in some of the cases recorded, a marked improvement took place while under treatment with the serum, even if one is not disposed to credit this to the method itself.

Inman[6] has applied the method of the opsonic index to the *secondary infections* which have been credited with playing such an important rôle in the course of pulmonary tuberculosis. His paper is a most exhaustive one, illustrated by thirty charts, which will well repay careful study. It is not too much to say Inman is the first to put this vexed question on a satisfactory footing. Much of the work of past investigators, as he points out, is now recognized to be inconclusive and out of date. For example, the mere recovery of a micro-organism does not necessarily denote it as an affecting agent, especially so when the site of the infection contains even virulent strains of pathogenic bacteria under normal conditions, as the mouth and nasopharynx do. Ulcers of the lung, as he further points out, being exposed to the outer world, can hardly avoid contamination with pathogenic bacteria, and it is not sufficient to recover such bacteria in addition to the tubercle bacillus to assign them an active rôle. Nor is the part they play to be established, even when their virulence is proved by animal inoculations. He concludes that in the opsonic index, a test able to measure a deficiency as well as an increased production of protective substances, we have a means for deciding the activity of these secondary organisms and the effect they produce on the body at large. It is unnecessary to go into the full details of Inman's research, but it is sufficient to say that the whole was carried out with special regard to avoid the possibility of prejudice or error.

The cases investigated were divided into four groups : (1) " Resting febrile "—cases with fever, at rest in bed ; (2) " Ambulant febrile, resting afebrile " ; (3) " Ambulant afebrile "—cases without fever while taking walking exercise ; (4) " Working afebrile "—without fever after performing the heaviest manual labour. The results were as follows : In Group 1, infection by secondary organisms as well as by the tubercle bacillus was present in twenty-five cases out of the twenty-seven cases investigated ; in Group 2, in three out of five ; in Group 3, in ten out of thirteen ; in Group 4, in four out of eleven.

Grouping them as " febrile " and " afebrile," secondary infection occurred in the febrile group in thirty-two cases ; in the " afebrile " in twenty-four cases, proving that the temperature chart alone cannot determine the presence or absence of a secondary infection. Inman's final conclusions are that the examination of the blood shows that " secondary infections " do occur, but that in nearly every case of

open tuberculosis of the lungs, the tubercle bacillus is the predominant infecting agent; except in the "afebrile" cases, where there is hope of some result from specific treatment directed against the secondary infections, the outlook is not very hopeful, and it is decidedly unhopeful in advanced cases.

Codeonal is recommended as a hypnotic for use in phthisis (*page* 10). The value of **Cod-liver Oil** is explained on *page* 10. Other drugs recommended are **Urotropin** (*page* 16), and **Combined Glandular Extracts** (*page* 20).

References.—[1]*Amer. Jour. Med. Sci.* 1911, ii, 469; [2]*Clin. Jour.* 1912, 280; [3]*Pract.* 1912, i, 248; [4]*Brit. Jour. Tuberculosis*, 1912, 33; [5]*Brit. Med. Jour.* 1912, i, 299; [6]*Lancet*, 1912, i, 975.

TUBERCULOSIS, RENAL. *Francis D. Boyd, M.D.*

Diagnosis.—Chevassu[1] discusses the value of the **Antigen Reaction.** He found the method in advance of any at present in use. The demonstration of *B. tuberculosis* in the urine admittedly gives inconstant results, even when the centrifuge and antiformin are employed. Inoculation experiments require six weeks before any conclusion can be drawn, and are complicated by the special resistance of certain animals.

The author has examined the value of the antigen method in 44 instances, with controlled reactions, obtaining exact results in 37 cases, unverified in four, and probably inexact in three. Even if the three cases are incorrect, the method furnished exact results nine times out of ten. It is admittedly too early yet to show if the antigen reactions will be as valuable as guinea-pig inoculation. If, however, these results are confirmed, the method should be eminently useful, for it will give in a day, the key to the problem which may now take six weeks, or even longer, to decide. The disadvantage of the method is that it is complex, and can be undertaken only by laboratory workers. Again, any error is positive, not negative. It therefore finds its chief value in excluding renal tuberculosis. In renal tuberculosis, the antigen reaction applied to the urine may give us a certainty of the non-tuberculous condition of the opposite kidney, thus enabling nephrectomy to be undertaken without misgiving. [It is only fair to state that so far British pathologists have not confirmed results obtained by Continental observers. Most positive results have been got by "short-cut" methods, which in the present state of our knowledge must be regarded with suspicion.—F. D. B.]

It is only within the last few years that we have learned to recognize renal tuberculosis clinically through the persistent *bladder irritability* which it causes. Braasch[2] gives consideration to 203 cases of renal tuberculosis operated on in the Mayo clinic. There was a noticeable preponderance of males. Although renal tuberculosis is generally considered as being confined largely to the young adult, 29 per cent of the patients were over forty years of age. Hæmaturia was present in 60 per cent, and occurred about twice as often in the male as in

the female. Bladder irritability was a primary symptom in 86 per cent, renal pain either alone or co-incidentally with bladder irritability in 25 per cent, and hæmaturia in 60 per cent. A renal tumour was palpable in only 20 per cent of cases.

While as a rule the urine in renal tuberculosis is acid, and free from bacteria other than the tubercle bacillus, secondary infection frequently occurs, and the clinical symptoms may be markedly altered. When secondary infection occurs there may be comparative cessation of bladder symptoms, pain and tenderness in the kidney area, fever and chills, and pallor and weakness from toxin absorption.

Fenwick[3] finds that it is rare to miss *B. tuberculosis* in the urine. In only 4 per cent of 500 cases was failure noted ; and it occurred in patients who harboured an extensive flora, nearly always due to energetic vesical irrigation. He contends that practitioners do very great harm by washing out a tuberculous bladder.

Cunningham,[4] from clinical and experimental study, concludes that tuberculosis of the kidney is not frequently associated with tuberculosis of the lungs, even when the latter is advanced. He finds that it is not common for the tubercle bacillus to be eliminated through the kidneys without affecting the organ in patients suffering from pulmonary tuberculosis.

Newman[5] urges the importance of *frequent micturition*, and especially nocturnal micturition, which may exist long before any other complaint is made by the patient suffering from renal tuberculosis in the early stages. In young adults this, and augmentation in the quantity excreted, are the first indications of disturbance in the urinary tract, and should be scrutinized most carefully. They are not present without a cause, and to pass them over as of no consequence may be most dangerous. The absence of pain in the early stages makes it all the more probable that the patient will regard the condition as unimportant, and the practitioner may only hear of its occurrence at a date when other more obvious and distressing symptoms develop. He lays great stress on the tendency of symptoms to show remission.

Treatment.—At the German Urological Society a discussion took place on the **Tuberculin** treatment. Bachrach[6] said, and with him there was substantial agreement, that it is not suitable for operable cases of renal tuberculosis. Early cases where bacilli are found without marked suppuration or interference with renal function, may be treated with tuberculin till a definite indication for nephrectomy arises. After nephrectomy, tuberculin treatment is advisable if tubercle is present in the genital tract or elsewhere. It results in improvement of the general health, but so far definite cure of local deposits has not been proved. It must be carried out so as to produce no reaction.

References.—[1]*Presse Méd.* 1912, 173 ; [2]*Jour. Amer. Med. Assoc.* 1912, i, 397 ; [3]*Med. Press and Circ.* 1911, ii, 548 ; [4]*Zeits. f. Urol.* 1912, i. ; [5]*Boston Med. and Surg. Jour.* 1911, ii, 872 ; [6]*Pract.* 1911, ii, 13 ; 1912, ii, 36.

TUBERCULOSIS, SURGICAL. (*See also* SINUSES; SPINAL CARIES; TUBERCULOSIS, RENAL.) *Priestley Leech, M.D., F.R.C.S.*

Elmslie[1] investigated the *cause of crippling* in 3,275 crippled children examined in the London County Invalid Schools during the last five years, and found 1,634 cases due to surgical tuberculosis. Biesalski, in 1906, took a census of the crippled children in Germany, and out of 75,183 cases 11,303 were due to tuberculosis.

TREATMENT.—From a study of cases which had been under treatment at various hospitals, Elmslie formed a very poor opinion of the results of such radical operations as excision of the knee. The *principles* of treatment are: (*a*) Early diagnosis; (*b*) Exact diagnosis, including routine radiography, so that cases of focal disease in bone fit for radical treatment may not be missed. This applies especially to the knee and other accessible joints; (*c*) Correction of any deformity already developed. As a rule, this is completely neglected in spinal caries, although hyper-extension of the spine in early cases will gradually undo a part at least of the deformity; (*d*) Rest and fixation in that position which will be best should ankylosis supervene, e.g., the spine in slight hyper-extension, the hip extended, slightly abducted, with the foot pointing directly forwards, the knee fully extended, etc. The spine and hip can only be satisfactorily treated with the child recumbent; (*e*) Conservative treatment of abscesses, postponing operation and using aspiration in preference to incision; (*f*) After-treatment by fixation or support, as long as is necessary to prevent subsequent contracture. The complete period of treatment is always to be measured in years. The best results have been attained in the special children's hospitals; convalescent homes, he thinks, are suitable only for cases sufficiently recovered to need no further treatment.

Gauvain[2] writes that in all cases of surgical tuberculosis general treatment is needed. As regards *climate*, in England the country or seaside is the best; mountain treatment is out of the question in Great Britain. He thinks country treatment best for early cases, and marine for the more advanced or chronic ones, including those with old sinuses. Patients should be educated, adolescents trained, and adults occupied according to their ability. Non-operative treatment gives the best results even in adults; of course there are exceptions. He lays great stress on the prevention of sinuses. French authorities estimate that 75 per cent of spinal cases with sinuses will die. The prognosis is always worse in cases complicated by added infection, and at least 50 per cent of patients suffering from spinal caries with opened abscesses progress to sinus formation.

Gertrude Austin[3] has visited Leysin, in Switzerland, to see Dr. Rollier's **Heliotherapy** for tuberculosis in children. That it should be possible to expose little children for hours daily without clothing of any kind to the sun's rays in midwinter at an altitude of 5000 feet seems quite incredible; and yet this is systematically done, and with the most brilliant results, in cases of surgical tuberculosis at Leysin. The treatment is carried out in open galleries communicating with

PLATE XLII.

HELIOTHERAPY IN MIDWINTER AT AN ALTITUDE OF 5000 FEET

Kindly lent by the "New York Medical Record"

the wards and facing due south (*Plate XLII*). At first, the actual seat of disease is uncovered for five minutes only, as there must be no blistering or burning of the skin ; the next day the region is treated for two periods of five minutes each, separated by an interval of half an hour, and on the third day these exposures are lengthened to fifteen or twenty minutes. At each séance a larger area of skin is uncovered, so that by the end of a week or ten days (for each case needs individual study) the entire body, the head excepted, is lying nude in the sun. The head has to be protected for some time longer to prevent congestion, but it too is ultimately brought to tolerate the sunlight.

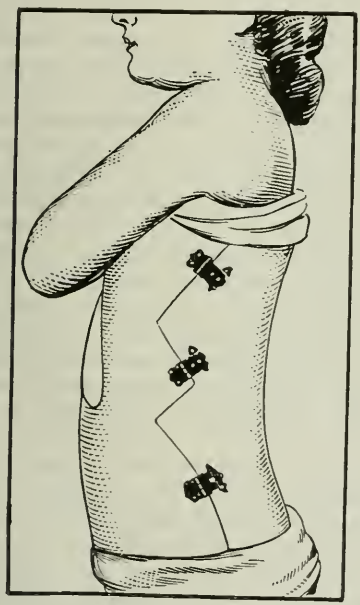


Fig. 104.—Showing the zigzag method of buckling the plaster case.

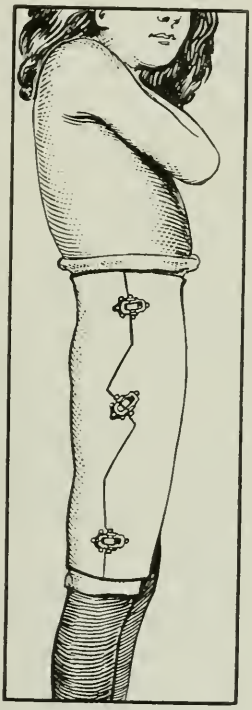


Fig. 105.—Showing the plaster splint buckled together over a layer of soft material.

The patients are wheeled out in their beds on to the galleries as soon as the sun appears, and lie there naked for hours, being moved back into the house only when the cool night air begins to make itself felt. Dr. Rollier fears the open abscess more than any other complication with which he has to deal.

Nové-Jesserand and A. Rendu[1] prefer **Plaster Cases** to celluloid and moulded leather, and in order to make them immovable and removable for heliotherapy, they proceed as follows for a Sayre jacket. A cotton jersey is first put on, and then a layer of wool ; down each side from the axilla to the hip is placed a length of thick cotton about seven or

eight inches wide, held in place by a gauze bandage. The plaster is mixed as thick as chocolate cream; the bandages loosely rolled are placed in it, taken out just before it begins to set, and rolled round the body. When dry, the jacket is cut with a sharp knife down each side, not vertically but zigzag (*Figs.* 104, 105). The cotton strip protects the body. When dry, two layers of gauze are fixed to its inner surface by means of celluloid, and the ends of the layers are turned over the edges of the two sections of the jacket; one or more layers of celluloid are placed on the weak portions.

Rosenbach,[5] of Göttingen, publishes the results of the treatment of surgical tuberculosis by his **Tuberculin.** It is over three years since he treated his first case by this means, but he thinks that this lapse of time is for many cases too short to say whether cure has been attained or not. He divides tuberculous lesions into three groups: in the first, the tuberculous tissue is alive throughout and capable of retrogression, or at least of being absorbed. Such lesions are the majority of joint fungosities; hydrops tuberculosus, with fibrinous or clear effusion; tuberculous bursitis; tuberculosis of the peritoneum, etc.

In the second group, the tuberculous tissue is for the most part as in the first, but contains small particles of fat, etc., which are unabsorbable, and also caseous portions; in the third, the tuberculous tissue is mainly suppurating, necrotic, and caseous; there are also vascularized tissue, and tuberculous new formation with giant cells and granulations. In the first class, where the lesion is a closed one, absorption and healing have been the rule after treatment with Rosenbach's tuberculin; and he has never seen a generalized infection. In the others, an intensive inflammation follows, going on to suppuration in most cases, which either escapes naturally or is opened surgically. In the third group, operative measures must be taken to remove caseous foci, bony sequestra, etc.

Technique.—*A. Local Injection.*—(1) In *closed lesions*, the injection is made into the centre of the lesion, or into a cavity if present. The subsequent inflammatory pain is relieved by position, cold compresses, and morphia injections. Joints and limbs are immobilized. (2) In *open lesions*, e.g., fistulæ, etc., the injections are made into the walls of the sinus or fistula, either through the skin or from the fistulous surface itself. In such lesions, especially if not aseptic, this is often the only successful method

B. Subcutaneous Injection is indicated in cases where the lesion cannot be injected locally, e.g., tuberculosis of the spine, glands, intestine, pelvis, and lungs. (1) In *closed lesions*, the action of subcutaneous injection is not so marked and perhaps causes less inflammation. (2) In *open lesions*, subcutaneous injection in many cases exercises a favourable influence and leads to healing.

For the *diagnosis* of tuberculosis the tuberculin is used as follows. To begin with, 0·01 to 0·1 c.c. is injected subcutaneously, according to the age and strength of the patient. If no reaction occur, 0·2 c.c. and then 0·3 c.c. are injected, and if in twenty-four to forty-eight hours

there is no reaction, then 0·5 c.c. is injected. If with this dose there is no reaction, one may conclude that there is no tuberculous lesion, or at least none in relation with the circulation.

The *therapeutic dose* for a child is 0·2 c.c., unless the experimental injection has shown great susceptibility. This is increased and repeated according to the reaction and the condition of the patient; if the dose is small, in a day or two; if large, a fortnight is not too long between the doses. Suppuration of the lesion after injection of tuberculin is not looked upon as a misfortune, but often as a benefit, as by this means prolonged and useless conservative treatment is avoided.

Atkinson Stoney[6] records results obtained by intramuscular injection of **Dioradin,** a fluid with the following composition: albuminate of iodine, 0·75 cgram; menthol, ·06 cgram; one-tenth of a drop of radium-barium chloride in ethereal solution (five millions unity maché) made up to 1 c.c. with camphorated oil. One c.c. of this fluid is injected deeply into the gluteal muscles daily for thirty days, and then every second day until forty injections have been given altogether. This constitutes one course of treatment. Two or more series of injections may be given at intervals of about a fortnight. At least two courses are usually considered necessary for a cure. Atkinson Stoney has tried this method on fifteen cases, in some of which tuberculin and other treatment had failed. He thinks that the results are decidedly good, and better than any he has obtained by the use of tuberculin in any form. (*See also page* 13, *and* TUBERCULOSIS OF LUNGS.)

Stiles[7] is of opinion that a large proportion of surgical tuberculosis in children is of bovine origin. *Osseous tuberculosis* is practically always hæmatogenic in its origin. In a large proportion of cases, the primary focus is situated in the lymphatic glands, especially the upper deep cervical set, which drain from the oral and nasopharyngeal cavities, including the faucial and pharyngeal tonsils. Next in importance come the bronchial and mesenteric glands. From these glands, when caseated and destroyed, the bacilli sometimes gain access to the small veins, are carried into the systemic circulation, and become arrested in the tissues, causing a lesion or becoming destroyed by the child's resistance.

Stiles's experience has shown him that the primary focus in the long bones is in the metaphysis (diaphysis), and not in the epiphysis. The disease may begin in the bone or in the joint. If it begins in the bone, in the metaphysis, the smaller the epiphysis the sooner it reaches the joint. The elbow and hip are good examples. He divides osseous tuberculosis into metaphysitis, epiphysitis, and diaphysitis. In the rare instances in which the disease begins in an epiphysis, it does so more especially in those which are relatively large, and which begin to ossify early, e.g., at the knee. The reason why primary bone foci are so much more frequently met with at the elbow than at the shoulder or wrist is that the nutrient arteries of the humerus and bones of the forearm are all directed towards the elbow, and the same fact probably explains why a tuberculous focus is much more frequently

met with in the upper than in the lower metaphysis of the femur. The frequency of tuberculous dactylitis is also accounted for by the blood-supply of the bones.

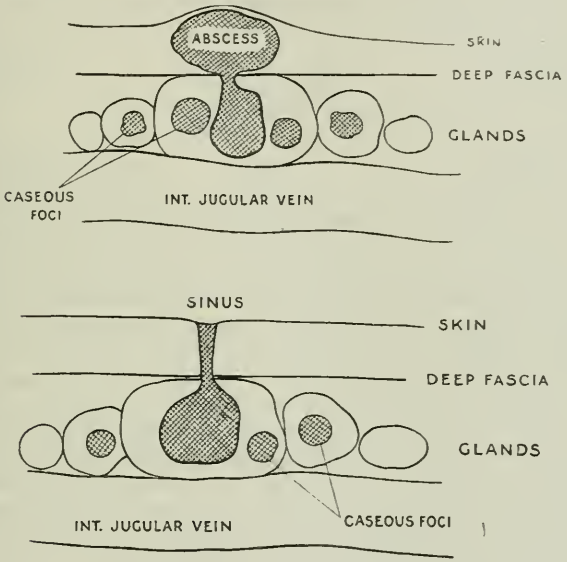
A circumscribed focus of tubercle in the metaphysis should, if possible, be removed by **Operation** before the adjacent joint becomes involved; this may be done either by gouging and curettage, or by a subperiosteal resection. In most cases, tuberculous diaphysitis should be treated by subperiosteal resection rather than by gouging and curettage, except perhaps in case of the femur. If the metaphysis as well as more or less of the diaphysis is involved, and the affected portion of bone is divided and wrenched away from the epiphyseal cartilage, the latter does not come away with the diaphysis but always adheres to the epiphysis. If this is done before the periosteum is invaded, its bone-forming properties are such that it is capable of reproducing the portion of bone removed. In the after-treatment, it is advisable to apply extension to the leg in order to keep the periosteal tube on the stretch, so that shortening and angular deformity may not occur.

After excision of the head and neck of the *femur* for tuberculous disease, to obtain a stable weight-bearing leg, the leg should be placed in the abducted position with the trochanter firmly planted into the acetabulum, and the muscles stitched back over it. In excision of the *knee*, nailing of the tibia to the femur greatly facilitates after-treatment, and at the same time ensures osseous ankylosis in good position: the same holds good if the foot is nailed to the tibia after excision of the *ankle*. In excision of the *elbow*, it is often necessary to combine the operation with subperiosteal resection of a considerable portion either of the humerus or of the bones of the forearm. A good *x*-ray photograph is an absolute necessity previous to operation.

Tubby[8] says the conception of tuberculous arthritis has undergone a change, the general condition of the patient coming first and that of the joint second. Sanatorium treatment is of the first importance, and *x*-rays should be employed systematically for diagnosis and regulation of treatment. Tuberculous arthritis is a disease which varies much in intensity, and unless the progress of the disease be watched constantly by using *x*-rays, clinical observation, and reaction of the patient to vaccination, it is quite impossible to form an opinion as to its future course. He postpones surgical treatment, especially in children, as long as possible. He advocates Ménard's treatment for abscess as given by Gauvain;[9] if pus re-forms, it is generally due to the presence of sequestra, which can be ascertained by means of Röntgen rays. In these cases, the cavity should be opened, sequestra removed, pockets emptied, the walls rubbed with dry soft swabs but not scraped, pure carbolic applied for about a minute, the cavity washed out with absolute alcohol, dried, and sewn up. It is wrong to drain. Conservative treatment with fresh air, etc., on the whole gives the better results. In tuberculous dactylitis, conservative and climatic

measures should be carried out from the first, and if these do not give an early and satisfactory result, amputation of the finger is desirable. Generally speaking, the disease is more extensive in operation than is shown by the *x*-rays.

Lymphadenitis.—Pybus[10] draws attention to the fact that scraping and draining a tuberculous abscess in the neck may yet leave the original focus of the disease untouched. He has had to treat three cases where several operations had failed to cure. The gland which had given rise to the abscess lay beneath the deep cervical fascia; the only efficient treatment is to open the deep cervical fascia, and remove



Figs. 106, 107.—Diagrams showing the foci of disease, extrinsic to the abscess.

the whole chain of glands, together with the infected muscle and skin (*Figs.* 106, 107).

Hawes[11] reports fifty-six cases of tuberculous adenitis treated with **Tuberculin.** He gave a bouillon filtrate, the initial dose being 1–10,000 to 5–10,000 mgrams, gradually increased from 5 to 10 mgrams. Reactions are avoided if possible. Out of the fifty-six patients treated, in twenty-seven the disease has been apparently cured or arrested, while in sixteen others the condition of the patient has been improved.

REFERENCES.—[1]*Lancet*, 1912, i, 424; [2]*Ibid.* ii, 356; [3]*Med. Rec.* 1912, i, 1074; [4]*Presse Méd.* 1912, 584; [5]*Deut. med. Woch.* 1912, 539, 589; [6]*Med. Press and Circ.* 1912, i, 325; [7]*Jour. Amer. Med. Assoc.* 1912, i, 527; [8]*Lancet*, 1912, i, 4; [9]*Ibid.* 1910, i, 633; and MEDICAL ANNUAL, 1912; [10]*Northld. and Durh. Med. Jour.* 1911, 268; [11]*Boston Med. and Surg. Jour.* 1912, i, 80.

TYLOSIS PALMARIS ET PLANTARIS.

E. Graham Little, M.D., F.R.C.P.

Three children, two boys and a girl, brothers and sister, inhabitants of Shetland, showed this condition, well described by Thatcher.[1] The children remained unaffected until about the age of three years, when little warts became noticed on the palms and soles; the wartiness spread to form large patches, which remained intractable for years.

TREATMENT.—The method adopted, which seems to have been very successful temporarily, was **Maceration** of the warty surfaces with starch poultices, or strong solutions of carbonate of soda, **Scraping** the softened area, and applying **Salicylic Acid** plaster (3 per cent), or the following ointment:—

Acidi Salicylici	gr. xxx	Ol. Olivæ	℥xxx
Ichthyol	ʒj	Lanolini	ʒj

REFERENCE.—[1]*Edin. Med. Jour.* 1912, i, 342.

TYPHOID FEVER.

E. W. Goodall, M.D.

ETIOLOGY.—Several accounts of carrier cases have been published since our last edition; of these three are interesting. The first was that of a winch-driver on board a steamer, who, in the course of about four years, gave rise to twenty-seven cases of typhoid fever, twenty-six of these on one steamer on which he was employed for three and a half years.[1] The second was that of a milk-borne epidemic of typhoid, with strong evidence of origination in a man who had suffered from typhoid forty-six years previously. The infected milk was supplied from his dairy. The reporters[2] of this case call attention to "the fact that milk may be infected by a chronic bacillus carrier handling it, even though he is cleanly in his habits. This particular man was a better-class dairy farmer, who kept his home and his dairy much cleaner than the average dairyman. Moreover, he was personally clean." Besides the epidemic, there had been at different times six cases of what was believed to be typhoid fever on this man's farm from 1878 to 1909, the year of the outbreak.

In the third case, the carrier, who was the cause of a milk epidemic, was discovered by means of the serum (Widal) reaction.[3] Four dairies were implicated. The blood of the twenty-five persons connected with the dairies was examined, and there was only one that gave a positive reaction. His urine was then found to contain typhoid bacilli. He said that he had had typhoid fever twenty-six years previously, and that he had suffered from a few days' diarrhœa and headache two weeks before. Bigelow[4] reports two similar cases, in which a carrier was detected by a positive reaction of his serum.

From a study of thirty-four convalescent cases of typhoid fever, of which seven were carriers, C. W. Gould and G. L. Qualls[5] state, amongst other conclusions, that the *prostate gland* is a factor to be considered, as it excretes bacilli into the urine; that patients may expectorate typhoid bacilli; and that the leucocyte count of carriers

is normal. In their cases the opsonic index and the percentage of large mononuclear leucocytes were increased. Twenty per cent of this series of cases were carriers at the time they left the hospital. J. R. Hutchinson,[6] investigating a number of convalescent cases in the Manchester fever hospitals, found that 2 per cent became chronic carriers, 8·3 per cent were excreting the bacilli at the time they left the hospital, and that 6·3 per cent of these did not continue to be infective for more than one month from that time.

Diagnosis.—The results of a careful study of the *ophthalmo-reaction* in typhoid fever have been published by Austrian.[7] The typhoid toxin used was the dried and powdered alcoholic precipitate, dissolved in water, of a watery emulsion of eighty different strains of typhoid bacilli together with a small amount of sodium chloride crystals, ground for three hours in an agate mortar. This solution was dropped into the lower conjunctival sac, and allowed to run to the internal canthus. A typical reaction is limited to or maximal in the palpebral conjunctiva of the lower lid and in the caruncle; it appears in one to five hours, reaches its maximum in about six hours, and persists twenty-four hours or longer. The most characteristic sign is the deep purple congestion of the conjunctiva of the lower lid and of the caruncle.

A reaction, occasionally produced in persons suffering from other diseases, differs from the typhoid reaction in that the ocular conjunctiva is more constantly and deeply injected than the palpebral, there is more purulent secretion, and the caruncle is seldom affected. Even if the caruncle is involved in the injection, it is less intense and of shorter duration than the specific typhoid reaction. A positive reaction is obtained early in the disease.

C. B. Burke[8] describes a sign which he claims to be of value in the diagnosis of typhoid fever, as follows: "The arm of the patient is bound to the shoulder. You arch your thumb and middle finger in the shape of a horse-shoe, and place them over the biceps muscle of the arm so that the arch thus formed is completely filled; then firm pressure is made by the finger and thumb, and the hand is briskly raised (pressure being continued) so that the thumb and finger come together with a slight concussion. The result, if the reflex is present, is a fibrillary contraction of that portion of the biceps muscle traversed by the thumb and finger, producing an oval ridge, without complete contraction of the biceps muscle. The ridge thus formed disappears slowly." This reflex, according to Burke, is occasionally found in other diseases than typhoid; but if it is absent, the disease is not typhoid.

F. A. Prendergast[9] recommends the following as an early and sure test for typhoid fever: "The test consists in injecting with a fine hypodermic needle a few drops of a suspension of dead typhoid bacilli of a strength of less than 5 million per c.c. This strength may be easily made by taking the ordinary typhoid vaccine now on the market and diluting it as follows: Take one drop of the '1,000

million vaccine and add it to twenty drops of sterile saline solution. Mix thoroughly.

"After the solution has been injected intradermally (care always being taken to raise as superficial a bleb as possible and with a well-mixed solution) in twenty-four hours the *non-typhoid* patient shows a well-marked area of redness around the point of injection. The typhoid patient shows absolutely no reaction. The reaction (as a rule) begins to appear in twelve hours, reaches its maximum in twenty-four, and has disappeared in forty-eight. Any redness after forty-eight hours is considered an infection and is not taken as a reaction. The test should be repeated, with better precautions against infection. Rub the skin at the point of injection with alcohol, have a clean hypodermic syringe and needle, and use fresh sterile vaccine.

"This test gives no constitutional reaction (rise of temperature, malaise, chill, etc.), and has no elements of danger. In the negative cases (controls), a few patients have complained of slight soreness and itching at the point of injection twelve to twenty-four hours after the injection was given. This quickly subsided without treatment and gave no after-trouble."

He applied the test in 27 cases, 12 of which were typhoid. These all gave a negative reaction. Of the remaining 15, 3 gave no reaction; of these, 2 gave a history of previous typhoid. In the other 12 the reactions were positive. [This test should be tried by other observers; the reaction described seems to be the opposite of what one would expect from comparison with the tuberculin skin test, and the eye reaction both in tuberculosis and typhoid.—E. W. G.]

TREATMENT.—**Diet.**—It is well known that patients suffering from attacks of fever of any but the shortest duration, lose weight. The usual catabolic changes take place more rapidly than in healthy persons on a normal diet. The reserve fat is lost first, and afterwards the protein tissues become wasted. The loss of fat and protein is due to various causes, one of which is the restricted diet upon which cases of fever are usually placed. For some time past a more liberal diet in the specific fevers, and more especially in typhoid, has been advocated by physicians both in Europe and the United States. The diets recommended, however, have been somewhat empirical, and it is only within the last four or five years that they have been put upon a proper basis. This improvement has been effected in consequence of the investigations into the metabolism of the body, generally by Chittenden and others, and in the case of typhoid fever by Coleman and Shaffer.[10] Chittenden showed that the loss of protein could be prevented or diminished by increasing the proportion of carbohydrates and hydrocarbons in the food.

Coleman has been putting the results of these observations and experiments into practice in the treatment of typhoid fever. Hitherto typhoid patients have commonly been put on an exclusively milk diet, in quantities of the caloric value of 1000 to 2000 calories in the twenty-four hours. Coleman adds to the milk other substances, such

as those mentioned in the list given below, in such quantities that the total value of the diet shall be 2000 to 3000, and even up to 5,000 calories in the twenty-four hours. Meat and its preparations (except small quantities of meat broth, given to stimulate appetite and provide variety), vegetable and fruit foods containing much cellulose, or small seeds, such as berries, he believes to be harmful, and therefore does not give.

TABLE OF FOODS AND THEIR CALORY VALUE.

Name.	Amount.	Calories.
Apple sauce	1 ounce	30
Bread	average slice (33 grams)	80
Butter	1 pat ($\frac{1}{3}$ ounce)	80
Cereal (cooked)	1 heaping tablespoonful ($1\frac{1}{2}$ oz.)	50
Biscuits	1 ounce	114
Cream (20 per cent)	1 ounce	60
Egg	1 (2 ounces)	80
Egg, white	1	30
Egg, yolk	1	50
Lactose*	1 tablespoonful (9 grams)	36
Milk (whole)	(1 pint 350) 1 ounce	20
Potato (whole)	1 medium	90
Potato (mashed)	1 tablespoonful	70
Rice (boiled)	1 tablespoonful	60
Sugar, cane	1 lump	16
Sugar, milk	1 tablespoonful	36
Toast	average slice	80

Coleman[11] in five years has treated 129 cases on these lines, and claims that the patients do better on the more liberal treatment, as is shown by a lower death-rate, a lessened complication-rate, and a speedier recovery. Relapses, however, were more frequent. Emerson supports these claims from an experience of 113 cases treated by this method.

In a previous paper, Coleman,[12] replying to the criticism that the typhoid patient is not able to digest and absorb the amount of food recommended, states that in 1882, von Hoesslin showed that digestion in typhoid fever is only slightly below normal, a statement quite recently confirmed by Eugène Du Bois, who investigated several of Coleman's cases from this point of view. However, Du Bois' results are "not to be interpreted to mean that the typhoid fever patient may be fed indiscriminately with foods which may be taken by the healthy man with impunity, but simply that carefully selected, easily digested foods may be given to typhoid fever patients (in quantities proportioned to their digestive ability) without fear of harm." The stools of patients dieted in this way presented an unusually normal appearance.

* For practical purposes, the milk-sugar may be measured in a medicine glass. Each measured ounce weighs 18 grams. If milk-sugar is added to water in the proportion of 24 grams to 30 c.c. and the water brought to the boiling-point, it is completely dissolved. Such a solution, made daily or just before use, will be found convenient in administering the diet.

" Whenever the administration of the high calory diet is undertaken, careful attention should be paid to the behaviour of the stomach, the condition of the abdomen, and the number and character of the stools. If any acticle causes *persistent* disturbances of digestion, it should be diminished or stopped. Neither occasional vomiting, slight tympanites, nor mild diarrhœa has been found to contraindicate the diet. In all cases one should proceed cautiously, but not necessarily slowly, in increasing the amount of food. If for any reason a patient takes all food poorly, as in cases with alcoholic or other gastritis, the diet should be reduced to the simplest terms, but the patient should be given all the food he can take." Milk, sugar, and cream are prone to cause gastric disturbances.

The clinical guides to a patient's needs are his weight and the state of his appetite. " In the earlier stages of the disease, when the temperature is continuously high, it is always difficult and sometimes impossible to give patients the amount of food that will prevent loss of weight. In perhaps the majority of severe cases it will not be possible to give more than 3000 calories " ; but as convalescence is reached the amount should be increased, and during convalescence patients will take eagerly from 4000 to 6000 calories a day.

" The successful administration of the high calory diet depends upon unremitting attention to detail." The patient's preferences and idiosyncrasies for various kinds of food must be considered ; as great a variety of food should be given as is consistent with the patient's welfare. " Ordinarily, when a patient first comes under observation, he is put upon plain milk for a day or two. The subsequent procedure depends upon his condition ; that is, whether he is suffering from a mild or severe attack of the disease. In the former case, he may be allowed foods which require mastication ; in the latter, the diet should be liquid."

In this paper the writer gives a number of recipes for the combination of various foods, e.g. :—

For 1000 calories a day :—

Milk, 1 quart (1000 c.c.)	= 700 calories
Cream, $1\frac{3}{4}$ oz. (50 c.c.)	= 100 ,,
Lactose, $1\frac{3}{4}$ oz. (50 grams)	= 200 ,,

This furnishes 8 feedings.

With such combinations it is generally desirable to add eggs to the diet in order to raise the nitrogen to the desired amount. They may be given boiled soft or shaken up with the milk.

As an example of a menu, the following may be given. It furnishes 3910 calories a day.

Milk, 6 ounces	seven feeds each of these amounts given at 9 a.m., 1 p.m., 3, 7, 10, 1 a.m., and 4 a.m.	= 860 calories
Cream, 2 ounces		= 840 ,,
Lactose, 10 grams		= 280 ,,
	The total of the seven feeds	= 1980 ,,

At 7.0 a.m. :—

Egg, 1	=	80 calories
Toast, 1 slice	=	80 ,,
Butter, 20 grams	=	150 ,,
Coffee		
Cream, 2 ounces	=	120 ,,
Lactose, 20 grams	=	80 ,,
		510

At 11.0 a.m. :—

Egg, 1	=	80 calories
Mashed potato, 20 grams	=	20 ,,
Custard, 4 ounces	=	250 ,,
Toast (or bread), 1 slice	=	80 ,,
Butter, 20 grams	=	150 ,,
Coffee		
Cream, 2 ounces	=	120 ,,
Lactose, 20 grams	=	80 ,,
		780

At 5.0 p.m. :—

Egg, 1	=	80 calories
Cereal, 3 tablespoonfuls	=	150 ,,
Cream, 2 ounces	=	120 ,,
Apple sauce, 1 ounce	=	30 ,,
Tea		
Cream, 3 ounces	=	180 ,,
Lactose, 20 grams	=	80 ,,
		640

Crohn[13] gives similar tables of various articles of food and diets, with their value in calories. His conclusions, so far as they are warranted by observation of thirty cases, are that the diet is a practical one and is well taken by the patient ; the nutrition of the patient remains, in all but the most severe cases, unusually good ; the period of convalescence is shortened, and the disease seems to be better tolerated.

Records of a few cases of typhoid fever treated with the **Serum** of horses immunized against typhoid endotoxin have been reported by Forssman[14] and Lüdke.[15] The doses varied from 10 to 50 c.c. On the whole the results were favourable.

A detailed account of thirty-one cases treated with vaccine will be found in a paper by F. J. Sadler ;[16] but the results do not appear to be particularly convincing.

Graham Chambers,[17] recommends **Acetyl-Salicylic Acid** as an anti-pyretic in typhoid fever. It should be given in 3 to 5 gr. doses every four hours. The temperature is lowered and perspiration induced. The greatest effect on the temperature is obtained by sponging the patient about half an hour after the administration of a dose of the drug. Acetyl-salicylic acid should be given in solution. It is only slightly soluble in cold water, but freely in water containing sodium bicarbonate.

H. Whitehead,[18] following E. Schroeder's experiments on rabbits and observations on human beings suffering from typhoid fever, has investigated the effect of intestinal hæmorrhage on the agglutinating power of the patient's blood serum. From careful observations on fourteen typhoid cases in which hæmorrhage occurred, he has been able to confirm Schroeder's conclusions, that a loss of blood was followed by a considerable increase in the formation of agglutinins, and that this increase, though brief, lasted long enough to " help to tide the patient safely over a dangerous period." Whitehead therefore recommends that " in many toxic cases of typhoid fever, and more especially in those in which the blood gives a poor agglutination reaction, **Phlebotomy** to the extent of about 10 oz. (according to the physical condition of the patient), be tried as a treatment. It would in all probability give excellent results in many cases, as it would be without the accompanying dangers of intestinal hæmorrhage."

[A comment that may, I think justly, be made on this conclusion is that the agglutinating power of the blood is not necessarily a measure of its bactericidal or of its antitoxic power.—E. W. G.]

In a paper on *post-typhoid dyspepsia*, Bassler[19] gives an analysis of 472 cases of dyspepsia, in 24 of which the history suggested connection with a previous attack of typhoid. In 9 of these cases typhoid bacilli were present in the stools, that is, the patients were chronic carriers; but in none were the bacilli found in the urine, nor did any of the cases give a positive serum reaction. The exact cause of the dyspepsia of all the cases is not stated in the paper, if it was known; but in four there was evidence of chronic gall-bladder infection.

Four of the patients, two gall-bladder cases and two others, submitted themselves to a lengthy treatment. They were put on a **Diet** " arranged according to their work, age, and physical condition, given gr. $7\frac{1}{2}$ of **Urotropin** before meals, and gr. $\frac{1}{10}$ of **Calomel** one hour afterwards, and treated for six weeks with autogenous typhoid **Yaccine** up to 400 million at a dose at the same intervals. At the end of the third month, although all claimed to have been improved in their symptoms, further examinations of their stools were made, and in each the typhoid bacilli were present."

The value of **Normal Serum** in checking the hæmorrhages of typhoid fever is alluded to on *page* 39.

Prophylaxis.—Broughton-Alcock,[20] encouraged by the experiments of Metchnikoff and Besredka, has been extending to human beings their method of vaccinating against typhoid. These observers successfully vaccinated chimpanzees by injecting into them in two doses, at ten days' interval, an emulsion of sensitized living typhoid bacilli. Broughton-Alcock employed **Yaccine** of living typhoid bacilli sensitized with antityphoid horse serum. He states that there are two main advantages in this method over that in which dead bacilli are employed: first, there is no general, and only a slight local reaction, so that the inoculated person need not change his mode of living; and second,

the method is like that used in vaccination against smallpox, and a better immunity is produced. The sensitized bacilli will remain alive for over four months without exceptional precautions. The dose is from 500 to 750 million in 1 c.c. of 0·8 per cent saline solution, followed by double the number seven to nine days later.

Concerning the dosage of typhoid **Vaccine** for prophylactic inoculation, W. B. Leishman,[21] writes as follows: "The present system was adopted after experiments at Aldershot among troops going out to India. Inoculations of different doses were given to different groups of men, and the development of the protective substances was followed in these groups for a month. As the result of that experience we now give a dose of 500 million, followed by a second dose, on the tenth day, of 1000 million. Some authorities recommend more frequent doses. In the United States army three doses are given, with nine days' interval between each, and in a recent publication referring to the French army, four doses are recommended. Personally, I would rather give three doses than two, and four than three; but it is already sufficiently difficult to arrange for two, and it appears possible that in attempting to give more one might lose the chance of giving any. The interval of ten days I believe to be important. If you give the second dose sooner or later than this, there is danger of severe reaction. I have had more trouble with the possible danger of what is called 'the negative phase' than with anything else connected with inoculation, and it has taken years to combat the dread of it. I do not believe that an appreciable negative phase occurs with our present system and dosage; we have seen no evidence of it in our work in the army. If you can only arrange for one dose to be given, then you should give 1000 million at once; 500 million is too small a dose, and will not give more than a transitory immunity."

The writer then goes on to show that a healthy person inoculated during an epidemic of typhoid does not thereby become more likely to contract the disease, if infected, for a short time immediately after the inoculation, as was once thought to be the case.

The results of antityphoid inoculation in the United States army are given by Russell.[22] He confirms Leishman's observations, and states that this inoculation confers almost absolute immunity, certainly lasting for two and a half years, and perhaps longer; that it apparently protects against the chronic bacillus carrier, and is at present the only known means by which a person can be protected against typhoid under all conditions. He believes that general vaccination of an entire community could be done without interfering with general sanitary improvements, and should be urged whenever the typhoid-rate is high. As a rule the serum of a person vaccinated against typhoid gives a positive Widal reaction in five to ten days after inoculation. But there are exceptions, and a case of this nature is related by Maverick.[23] The individual was a youth of sixteen, who was inoculated on three different occasions within eight months with different strains of typhoid bacilli; yet his blood serum never showed the

presence of agglutinins, though that of four of his brothers gave a positive reaction after a first inoculation with one of the strains used upon him.

French evidence of the efficacy of antityphoid inoculation was given before the Academy of Medicine, Paris, at a meeting on Nov. 28th, 1911.[24]

Courmont, Rochaix, and Charlet[25] state that they have succeeded in vaccinating guinea-pigs, rabbits, and goats against infection by typhoid bacilli, by introducing killed typhoid bacilli into their stomachs. Their serum then contains agglutinating, bacteriolytic, and bactericidal substances. In man, as a result of observations on three adult males, they find a rapid increase in the number of mononuclear cells. This is taken to be a proof of the absorption of the killed cultures, from which it is concluded that immunity can be produced by this method of vaccinating as well as by the subcutaneous method commonly practised. (*See also pages* 46. 47).

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, i, 1336; [2]*Ibid.* 7; [3]*Ibid.* 1911, ii, 1418; [4]*Ibid.* 1912, i, 1339; [5]*Ibid.* 1912, i, 542; [6]*Med. Chron.* 1912, Jan., 187; [7]*Johns Hop. Hosp. Bull.* 1912, i; [8]*Med Jour.* 1911, ii, 1223; [9]*Med. Rec.* 1911, ii, 1325; [10]*Arch. Int. Med.* 1909, 538; [11]*Jour. Amer. Med. Assoc.* 1912, ii, 363; [12]*Amer. Jour. Med. Sci.* 1912, i, 77; [13]*Jour. Amer. Med. Assoc.* 1912, i, 259; [14]*Deut. med. Woch.* 1911, 1936; [15]*Münch. med. Woch.* 1912, 907; [16]*Quart. Jour. Med.* 1912, Jan., 193; [17]*Brit. Med. Jour.* 1912, i, 121; [18]*Lancet*, 1911, ii, 1067; [19]*Bost. Med. & Surg. Jour.* 1912, i, 850; [20]*Ibid.* ii, 504; [21]*Glasg. Med. Jour.* 1912, 401; and *Med. Press & Circ.* 1912, i, 190; [22]*Jour. Amer. Med. Assoc.* 1912, i, 1331; [23]*Ibid.* 1672; [24]*Sem. Méd.* 1911, 585; [25]*Rev. de Méd.* 1911, ii, 219.

TYPHUS FEVER. (*See also* PARATYPHOID FEVER.)

E. W. Goodall, M.D.

In a former number of the ANNUAL the writer gave reasons, based on reported clinical facts, for believing that "Brill's disease" is really typhus fever. Experimental evidence in favour of this opinion has recently been brought forward by Anderson and Goldberger,[1] whose researches into the etiology of typhus fever in Mexico are well known. These observers obtained the blood of a patient suffering from "Brill's disease" on the seventh day of the illness, and injected it into the peritoneal cavity of two rhesus monkeys. One gave no signs of a reaction, but the other, after an incubation period of about ten days, suffered from a febrile attack which lasted thirteen days and was followed by a fatal relapse. On the sixth day of this animal's fever, blood was drawn from its heart by puncture and used for the inoculation of two rhesus monkeys. Both developed well-marked febrile attacks, and with the blood of one of them Anderson and Goldberger commenced a series of successful inoculations through fifteen monkeys during a period of six months.

The post-mortem examination in that one of the first two monkeys which died, revealed no gross lesions. ·5 c.c. of its blood drawn on the sixth day of illness, was used to inoculate some nutrient broth, but no growth resulted.

Having shown that the intraperitoneal injection of the blood of a patient suffering from " Brill's disease " produced the disease in certain monkeys, and that the disease could be transmitted by injections from monkey to monkey, Anderson and Goldberger proceeded to investigate the question of the immunity conferred by an attack of " Brill's disease " against an attack of typhus. They tested the susceptibility to Mexican typhus of seven rhesus monkeys which had recovered from an attack of " Brill's disease," and the susceptibility to " Brill's disease " of ten monkeys which they had reason to believe were resistant to Mexican typhus. Of the seven Brill's-immune monkeys, in not one did typhus develop, although of nine healthy controls not one failed to react, the reactions being well marked in seven and abortive in two. Of the ten typhus-immune animals, in not one did " Brill's disease " develop, whereas of eight controls, only one failed to react. These experiments confirm the view that " Brill's disease " is identical with typhus fever.

Brill,[2] however, while admitting the facts furnished by Anderson and Goldberger, does not agree with their conclusions. He refers to the experiments of Metchnikoff and Besredka,[3] who showed that chimpanzees immunized against paratyphoid fever are immune to typhoid, and he suggests that " Brill's disease " and typhus fever are not identical but related diseases, just as paratyphoid and typhoid, vaccinia and variola, are related diseases. [But the clinical picture of " Brill's disease," as drawn by Brill himself, is exactly the same as that of typhus of a mild form.—E. W. G.]

Anderson and Goldberger conclude the first of the two papers which are here quoted, by narrating certain experiments which go to show that not only the body- but also the head-louse may be the means of conveying the infection of typhus fever from one person to another. To this paper is appended a full list of references. A summary of the recent advance in our knowledge of typhus will be found in another paper by these authors.[4]

Nicoll[5] and others report four cases of " Brill's disease " in one family. They admit that the disease must now be identified with typhus fever. The blood of one of these cases when injected intraperitoneally into two guinea-pigs, gave a febrile reaction after an incubation period of fifteen days, which lasted for several days, and one of the animals died. The blood of these guinea-pigs during the fever was injected into a monkey, and gave rise to a typical typhus from temperature reaction.

Treatment.—On *page* 19, **Tinct. Iodi,** in doses of ℥ iii–iv, t.d.s., is spoken highly of.

References.—[1]*N. Y. Med. Jour.* 1912, i, 976 ; *Pub. Health Rep.* vol. xxvii, No. 5, 1912, Feb. 2 ; [2]*Med. Rec.* 1912, i, 1037 ; [3]*Ann. de l'Institut Pasteur*, 1911, 193 and 865 ; [4]*Jour. Amer. Med. Assoc.* 1912, ii, 514 ; [5]*Ibid.* 521.

ULCERS OF LEG.

(*Vol.* 1912, *p.* 563)—Staige Davis's method of treatment by **Skin Grafting** combined with **Scarlet Red Ointment** is fully described at this reference.

ULCERS, VARICOSE. *E. Graham Little, M.D., F.R.C.P.*

Gills[1] has used the following method with much success: the ulcer is washed with solution of **Silver Nitrate** (gr. 30 to the oz.). The ulcer itself being protected with sterile gauze, the whole surface is then covered with adhesive strapping, which may be changed on alternate days. The period of cure averaged from three to seven weeks.

Coues[2] advocates routine examination by radiography of the bone underlying varicose ulcers, so-called; he claims that specific and non-specific periostitis may be differentiated by this means. A non-specific periostitis exists, and both forms benefit by administration of **Potassium Iodide.**

See also **Allantoin** (*page* 4), and **Aniline Dyes** (*page* 5).

References.—[1]*N.Y. Med. Jour.* 1911, ii, 1127: [2]*Bost. Med. and Surg. Jour.* 1912, i, 414.

UNCINARIASIS. *Leonard Rogers, M.D., F.R.C.P.*

E. E. Endicott[1] and H. Gunn[2] have studied the prevalence of ankylostomiasis in California, and find that the worm is very widely prevalent in the deep mines, and a serious cause of disease, having probably been imported by miners from Cornwall, Austria, Italy, etc. It is often overlooked. Many immigrants infected with the hook-worm have also entered California from Porto Rico, over 50 per cent having been found to be infected, but they are now inspected and treated before admission. No adequate measures have yet been adopted to deal with the prevalence of the disease in the Californian mines. M. W. Glover[3] reports the results of the examination of a large number of immigrants into California, the stools of 2255 aliens having been examined for the ova, with positive results in 1077. No less than 63 per cent of Hindus were found to be infected, and so many were rejected, most of them males from the Punjab, as greatly to check their immigration. After much experience the technique now adopted is to wash repeatedly with the centrifuge a small piece of the stool until all colour is removed, and to microscope one slide of the washed sediment without a cover-glass with a low power. The Japanese showed the next highest infection rate of 56 per cent, and then the Chinese with 39 per cent in males, and 20 per cent in females. The importance of excluding such sources of infection from the southern states, where the climate is suitable for the spread of the disease, is obvious.

Treatment.—W. H. Schultz[4] records the results of experiments with about twenty different remedies for ankylostoma, dogs being largely used. **Thymol** is one of the most active drugs for the purpose of expelling these parasites, but may cause serious faintness and abdominal pain. The dose for adults should be gr. 60, divided into two portions and mixed with one-third the quantity of milk sugar. The two parts are given with an interval of two hours, on an empty stomach in the morning, and a cathartic pill or a dose of magnesium sulphate the evening before, and the purge repeated two hours after

the thymol. Proportionately smaller doses must be used for younger patients, gr. 30 in those from ten to fourteen years, down to gr. 7½ if under five years. **Beta-naphthol** is a safer drug provided the kidneys are healthy—it may otherwise excite nephritis—but it is weaker, and the treatment may have to be repeated two or three times. If the patient cannot be kept under close observation during the treatment, this is a better drug than thymol, since it is much less depressant. After the usual preliminary starvation and purge, gr. 15 to 30 are given mixed with milk sugar in a gelatin capsule, the dose repeated after one hour, and a purge three hours later.

Male Fern is difficult to get in a reliable form in America, while it is less effective and more dangerous than the above drugs, a number of fatalities having resulted, as well as permanent blindness in several patients, so it is not recommended for use against ankylostoma. The **Eucalyptus and Chloroform** mixture of Hermann owes its value to the chloroform alone. In dogs he found chloroform very efficient in 3 c.c. doses well mixed with 10 c.c. of castor oil, but serious symptoms may be produced by it in man, such as irritation of the intestinal canal, and serious damage to the liver cells.

B. Nichol[5] records further observations on the effect of various drugs in expelling ankylostoma. The number of worms passed after each dose was carefully recorded. **Thymol,** given in three doses of gr. 30 each at two-hourly intervals, was most effective, 97·87 per cent of the worms being expelled by the first treatment, and none remaining after two treatments. Such large doses, however, caused very serious constitutional disturbance, with dizziness, drowsiness, and tendency to syncope, so as much as gr. 90 could not be given in out-door practice. **Beta-naphthol** in 60-gr. doses removed 86 per cent of the worms at the first dose, and 14 per cent at the second, and it is much less depressant than thymol. Eucalyptus, and also pelletierin tannate, gave very poor results, the latter being inert.

Izal, in three doses of 80 min. each, caused some nausea but no serious symptoms, and removed 90 per cent of the worms at the first treatment and the remaining 10 per cent at the second. **Beta-naphthol** was also tried in quantities of gr. 90 for one treatment, and then proved equal in its results to the same quantity of thymol, without anything like so much toxic effect, so this plan has been adopted for freeing Indian coolies from ankylostoma before admitting them to Natal. No less than 92·7 per cent of the Indian coolies tested showed ankylostoma, but the largest number recovered from any patient was 114, the average number being 22·2. Only 11 per cent showed over fifty worms.

Camillo Bozzolo,[6] after a lapse of thirty years, records his further experience on the treatment of ankylostomiasis, for which he was the first to use **Thymol** in large doses in the St. Gothard Tunnel outbreak in 1879. Having used the remedy continuously ever since, he still gives 2 grams every two hours for six doses, in capsules, and has never seen any serious disturbance follow such large doses, although he

gives a little wine after it. In cases of anæmia due to this parasite the treatment is most effective, if the disease is not too advanced. The thymol is best given finely powdered, or mixed with milk sugar, as advised by the Porto Rico Commission.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1102; [2]*Ibid.*; [3]*Ibid.* 1912, i, 1837; [4]*Ibid.* 1911, ii, 1102; [5]*Jour. Trop. Med. & Hyg.* 1912, i; [6]*Jour. Amer. Med. Assoc.* 1912, ii, 1744.

URETER, SURGERY OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Thelwall Thomas[1] relates his experience of seventeen cases of *calculus of the ureter*. He finds, in common with all who have experience in this condition, that it is necessary to have a complete radiographic investigation of both kidneys and ureter and of the bladder in every case, and also that this radiographic examination must be made very shortly before the operation.

Pain in the back was present in all this observer's cases, and colic in eleven. Pus and blood were present in the urine at some time during the illness in four, blood only in five, pus only in four, and neither in three. In a patient with persistent lumbar pain, renal colic with or without blood or pus in the urine, and a radiographic shadow in the line of the ureter, a diagnosis of ureteral calculus may be made.

These stones cannot be dissolved, but if small they may be washed out with diuretics. In one case the surgeon attempted the perineal route of approach to the lower ureter, and failed; an iliac extraperitoneal incision was then used. In another case a vaginal operation for ureteric stone was followed by a vesico-vaginal fistula. He dismisses the rectal, parasacral, trans-sacral, transperitoneal, and intra- and extraperitoneal combined methods as "not necessary of consideration; their very names sound dangerous, either on account of difficult dissection, or the possibility of septic contamination of important areas." The iliac extraperitoneal route is preferred, and the author splits the muscles in the direction of their fibres. A short communication by Chiasserini[2] relates to *ureteral grafts*. Ureteral anastomosis and implantation of the ureters has, he holds, nearly always given uncertain or unfavourable results. This is due to ascending infection and stenosis resulting in hydronephrosis and pyonephrosis. The author conducted a series of experiments with vascular grafts on the ureters of dogs. Use was made of portions of vein (external jugular, femoral, and saphenous) or of the carotid artery. The ureter was exposed by the extraperitoneal route, a portion of the ureter somewhat smaller than the graft excised, and the transplanted vessel sutured to the cut ends. In twelve cases the continuity between the two ureteral ends was re-established, but a stenosis or a complete occlusion corresponding to the vascular graft, was the usual result, with consecutive dilatation of the canal of the ureter and hydronephrosis.

REFERENCES.—[1]*Liverp. Med.-Chir. Jour.* 1912, 324; [2]*Lancet*, 1911, ii, 1476.

URETHRA, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Urethral Carcinoma in Women.—Whitehouse[1] collected all cases of carcinoma of the female urethra. The growth may affect either the meatus or the length of the canal, and in either situation may form a hard bleeding malignant ulcer, or a papillary growth. The latter affecting the canal, tends to form a sausage-shaped tumour; in the region of the meatus it is difficult to diagnose from certain cases of prolapse of the urethra.

The TREATMENT consists in wide **Excision** of the urethra, with removal of the inguinal glands.

REFERENCE.—[1] *Proc. Roy. Soc. Med.* v, No. 3.

URETHRA, SURGERY OF. *J. W. Thomson Walker, M.B., F.R.C.S.*

Carl Beck[1] discusses the present status of the operation for *hypospadias*. According to this surgeon, "cases of hypospadiac fatherhood are rare"; many of those afflicted with this malformation avoid matrimony altogether and some commit suicide. Beck addresses his remarks entirely to the balanitic type, or that form which affects the glandular urethra, and advocates the method of operation by which the urethra is dissected out and dislocated forward to replace the defective portion. The limit of extensibility of the adult penile urethra, based on Waldeyer's measurements during laxity and erection, is 2 inches, and it is unwise to elongate the urethra to its fullest extent on account of incurvation of the penis which results. About 50 per cent of the extensibility may be used, and all cases in which the false opening is located within 1 inch of the tip of the glans penis in the adult may be cured by this method.

The operation is performed by making an incision parallel with, and to one side of, the urethra, and dissecting out about 2 inches of the tube. A channel is made through the glans by puncture with a bistoury, and the urethral tube drawn through this by means of silk sutures, which are then used to fix its end at the new meatus. A catheter is retained in the urethra for five days, and the patient is kept under bromides.

Monsarrat[2] reviews the literature of *urethral calculi*, and relates three personal cases. Urethral calculi include all those lodged in the urethra, whether primarily formed in the canal or in some cavity or channel communicating with it, or arrested in the urethra during their passage from the bladder. The calculus is lodged, according to Englisch, in the membranous portion in 42 per cent, the bulbous urethra in 18·6 per cent, the scrotal and penile portion in 28·2 per cent, and the fossa navicularis in 11·2 per cent. In the first category this observer evidently includes calculi arrested in the prostatic urethra, which form a very large proportion of all urethral calculi. Encysted urethral calculi are those lodged in pockets or diverticula communicating with the urethra. Diverticula of the anterior urethra are congenital or acquired, the latter resulting from retention cysts of urethral glands, or blood cysts, stricture, operation scars, and urethral

fistulæ. An impacted calculus may form a pouch for itself by pressure or ulceration, and come to lie entirely outside the urethral canal. Diverticula of the prostatic urethra are congenital or acquired, the latter resulting from the pressure of prostatic calculi or the rupture of prostatic abscesses or cysts.

It is generally held that only phosphatic calculi are formed locally, while calculi composed of urates, uric acid, and calcium oxalate descend into the urethra from above. Lieblein and Finsterer have described calculi formed of urates, with or without phosphates or oxalates, which they considered, from the absence of symptoms of descent, to have been formed *in situ*. Primary prostatic calculi may form a communication with the urethra and thus lie in an acquired diverticulum of the urethra. They consist of phosphate and carbonate of calcium.

Monsarrat relates three cases of calculi in diverticula which communicated with the floor of the prostatic urethra. They consisted of calcium phosphate, calcium oxalate, and organic matter. In all three the clinical symptoms, the anatomy of the pouch in which the calculi lay, and their arrangement and number, pointed to their having been formed in the prostate gland and communicating secondarily with the urethra. The presence of calcium oxalate cannot therefore be accepted as evidence that the calculus had descended from the higher urinary passages.

The diagnosis of encysted calculus of the prostatic urethra depends upon pain and difficulty in micturition, variation in the stream, marked urethral spasm and grating on the passage of an instrument, absences of improvement after the passage of bougies, and palpation of the calculi by rectal examination.

The calculi should be removed by the perineal route, and the wall of the pouch or diverticulum ablated by scissors and scraping.

Joubert[3] discusses the compensation due to workers suffering from *traumatic stricture of the urethra*. The cases are divided into infected and non-infected, and the former into those in which the bladder only is involved, and those in which the infection has ascended to the kidneys. A second class comprises those in which there is a fistula, while in a third there is neither infection nor fistula, but the stricture is resilient and liable to cause retention. Finally, there are the benign strictures which are readily amenable to dilatation.

A man with traumatic stricture can work, but is exposed to many dangers, among them the effects of the necessary therapeutic measures, and he loses time in these and other ways. His loss of value is variously stated in the French, German, and Austrian official lists, but Joubert gives the following percentages according to his own views. In renal infection, a mortality of 80 to 100 per cent is a frequent result; in vesical infection, 60 to 70 per cent, on account of the danger of renal complication and the difficulty of cure; in non-infected cases with fistula and perineal induration, 60 to 70 per cent,

as operations are frequently unsuccessful and also the patient may refuse operation. In cases of resilient stricture without infection or fistula, frequent treatment is necessary; these he places at 40 to 50 per cent. Benign cases readily amenable to treatment, he values at 10 to 40 per cent.

Kobelt[4] has used, and speaks highly of, a method of treatment of stricture introduced by Scharff. Hyperæmia of the stricture is produced by **Electrically Heated Bougies.** The metal instruments are introduced at the temperature of the body, and the temperature is raised to 50° C. There is a remarkable absence of pain. After ten or fifteen minutes a larger instrument is substituted. In no case should the instrument be left in for two or three hours, as œdema will follow.

REFERENCES.—[1]*Med. Rec.* 1911, ii, 724; [2]*Brit. Med. Jour.* 1912, i, 3; [3]*Presse Méd.* 1912, 598; [4]*Münch. med. Woch.* 1912, 1655.

URINE TESTS. *Oskar C. Gruner, M.D.*

Estimation of Glucose.—In Benedict's[1] modification of Fehling's method, the urine must be tested before and after fermentation with yeast. If the reducing action is apparent after twenty-four hours' fermentation, the reduction is not due to glucose but to lactose, or glycuronic or homogentisic acid. His reagent contains:—

	gm. or c.c.
Copper sulphate (pure crystallized)	17·3
Sodium or potassium citrate	173·0
Sodium carbonate (crystallized)	200·0
(One half the weight of the anhydrous salt may be used.)	
Distilled water to make	1000·0

The citrate and carbonate are dissolved together (with the aid of heat) in about 700 c.c. of water. The mixture is then poured (through a filter if necessary) into a larger beaker or casserole. The copper sulphate (which should be dissolved separately in about 100 c.c. of water) is poured slowly into the first solution, with constant stirring. The mixture is then cooled and diluted to one litre. This solution keeps for years.

No strongly dehydrating substance (such as caustic alkali) is present in the new reagent, hence its reduction product is apt to be yellow, or even greenish-yellow (consisting of the hydrated suboxide of copper) rather than the red suboxide. For the detection of glucose in urine, about 5 c.c. of the reagent are placed in a test tube, and eight to ten drops (not more) of the urine to be examined are added. The mixture is then heated to vigorous boiling, kept at this temperature for one or two minutes, and allowed to cool spontaneously. In the presence of glucose, the entire body of the solution will be filled with a precipitate, which may be red, yellow, or greenish in tinge. If the quantity of glucose be low (under 0·3 per cent), the precipitate forms only on cooling. If no sugar be present, the solution either remains

perfectly clear, or shows a faint turbidity that is blue in colour, and consists of precipitated urates. Use only eight to ten drops of urine; boil vigorously; the mixture must become opaque throughout at once.

A similar solution for *quantitative* work has this composition:—

	gm. or c.c.
Copper sulphate (pure crystallized)	18·0
Sodium carbonate (crystallized)	200·0
Sodium or potassium citrate	200·0
Potassium sulphocyanate	125·0
Potassium ferrocyanide solution (5 per cent) ..	5·0
Distilled water to make	1000·0

With the aid of heat dissolve the carbonate, citrate, and sulphocyanate in enough water to make about 800 c.c. of the mixture, and filter if necessary. Dissolve the copper sulphate separately in about 100 c.c. of water and pour the solution slowly into the other liquid, with constant stirring. Add the ferrocyanide solution, cool, and dilute to exactly one litre.

Of the various constituents, only the copper salt need be weighed with exactness. Twenty-five c.c. of the reagent are reduced by 50 mgram of glucose.

Method.—Dilute 10 c.c. of urine with 90 c.c. of water and place in a burette. Twenty-five c.c. of reagent are put into a porcelain basin. Add 10 to 20 grams of crystalline sodium carbonate and a little powdered pumice stone. Boil. Now run in the urine from the burette until a chalk-white precipitate forms. As the blue disappears, run it in more slowly. The end point is reached when the blue has entirely gone.

The following formula gives the percentage:— $\frac{\cdot 050}{X} \times 1000$

"X" is the number of c.c. of diluted urine required to reduce 25 c.c. of copper solution. Chloroform must not be present.

Estimation of sugar in urine by the *Citron method* is advocated by Green.[2] Twenty c.c. of Fehling should require 28 to 30 c.c. of decinormal sodium thiosulphate solution (2·483 per cent) to be reduced. If the specific gravity of the urine to be tested is below 1030, add an equal volume of water; if over 1030, add four volumes; if over 1041, add ten volumes. Boil 20 c.c. Fehling with 10 c.c. water in an Erlenmeyer flask; while boiling, add 5 c.c. dilute urine and boil two more minutes; then add 20 c.c. of 20 per cent potassium iodide, 20 c.c. of 20 per cent sulphuric acid, and 1 c.c. starch solution. At once run in $\frac{N}{10}$ sodium thiosulphate from a burette till the blue colour of the starch iodide disappears. The number of c.c. used on a blank determination on Fehling solution—the number of c.c. used in determination on 5 c.c. diluted urine = number of c.c. corresponding to the amount of glucose present.

The following table gives the results in milligrams. The percentage is readily calculated.

c.c. Thio-sulphate.	Mgrams Glucose	c.c. Thio-sulphate.	Mgrams Glucose.	c.c. Thio-sulphate.	Mgrams Glucose.	c.c. Thio-sulphate.	Mgrams Glucose.	c.c. Thio-sulphate.	Mgrams Glucose.
1	3·1	7	22·3	13	42·5	19	63·3	25	86·5
2	6·1	8	25·6	14	45·9	20	66·6	26	90·6
3	9·3	9	28·9	15	49·3	21	70.7	27	94·8
4	12·5	10	32·3	16	52·8	22	74·5	28	97·9
5	15·7	11	35·7	17	56·3	23	78·5	29	100·0
6	19·0	12	39·1	18	59·8	24	82·5		

The detection of certain substances in the urine is materially assisted by the use of the *spectroscope*, as recommended by R. T. Williamson.[3]

Glycuronic Acid.—Toller's test consists in adding a fragment of naphtho-resorcin to 5 c.c. urine, then 5 c.c. strong hydrochloric acid, and boiling for a minute. After four minutes the mixture is cooled under flowing water, and shaken with ether. The depth of the blue colour shows the amount of glycuronic acid present. Normally, it is very faint. The spectroscope gives a well-marked absorption-band in D. (*Fig.* 108, *No.* 6.)

Hæmatoporphyrinuria.—A dark-coloured urine giving negative results with blood, albumin, and bile tests, and a spectrum of alkaline hæmatoporphyrin which cannot be converted into reduced hæmoglobin, owes it colour to the substance named. The bands are more easily seen in an amyl-alcohol extract of the urine; should the extract be turbid, a few drops of absolute alcohol will make it transparent for the spectroscope. This condition is noted after administration of sulphonal or trional, and in enteric fever, liver affections, plumbism, and other toxæmias. It may occur paroxysmally.

Eosin.—The urine is reddish in reflected light and greenish in transmitted light. Eosinuria is due to eating "sweets." The absorption-band is at E and b. (*Fig.* 108, *No.* 3.)

Urorosein.—This is often met with in chlorosis, according to Williamson. An absorption-band is found in the green part of the spectrum between D and E. (*See also* CANCER, LABORATORY DIAGNOSIS OF.)

Cholesterin.—Williamson recommends the following test: Dissolve a little cholesterin in 3 c.c. chloroform. Add 1 c.c. glacial acetic acid and then seven to eight drops concentrated sulphuric acid. Mix the fluids with a glass rod and examine the blue solution with a spectroscope. A band between C and D, and between D and E, are seen (*Fig.* 108, *No.* 4.) When the fluid has become dark green-blue, a broad absorption-band is seen between C and D. (*Fig.* 108, *No.* 5.)

Pentose.—A satisfactory test consists in adding 5 c.c. strong hydrochloric acid to an equal quantity of urine. A little orcein powder

is added, and the mixture boiled. The fluid will turn reddish-blue, and then bluish-green, and gives an absorption-band between C and D. (*Fig.* 108, *No.* 7.)

Urochromogen.—Three drops of a 0·1 per cent solution of $KMnO_4$ are added to 1 c.c. of urine diluted with 2 c.c. distilled water. The appearance of a yellow colour, while the solution remains clear, indicates the presence of urochromogen. Heflebower[1] has studied the

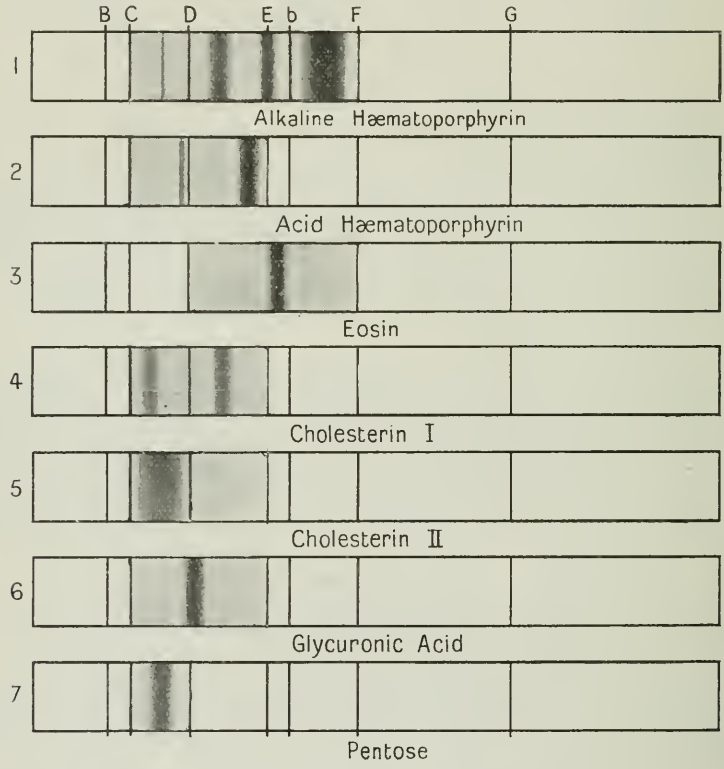


Fig. 108.—Absorption-bands as shown in the spectroscope.

relation between excretion of urochromogen and grade of *pulmonary tuberculosis*, assuming that the diazo-reaction of Ehrlich is a test for urochromogen. The diazo-reaction is positive in "ambulant" or non-serious cases, positive in 15·7 per cent of intermediate cases, and 42·8 per cent of bed-ridden patients. The urochromogen test gives very similar results, but is more delicate. A constant negative diazo, or urochromogen, reaction in a case of pulmonary tuberculosis indicates that the case is doing well; a constant positive result is a

bad sign. The urochromogen reaction is more reliable than the diazo test.

Green Urine.—Distinguishing tests between methylene blue and indigo sulphate as causes of blue urine are given by Golla and Rolleston.[5] (1) Evaporate an aqueous solution to dryness and heat gently. Methylene blue readily clears and gives a faint grey sublimate; indigo gives characteristic purple sublimate. (2) To the solution to be tested add potash: methylene blue = no effect, indigo gives discharge of the colour reappearing with acid. (3) To the solution to be tested add strong nitric acid: methylene blue is not altered; indigo sulphate is decolorized. (4) Test for zinc: this is present in commercial methylene blue, absent in indigo sulphate.

The use of the methylene-blue test for the *diagnosis of cancer*, noting the disappearance of the blue colour in such cases, has been found to be entirely unreliable by Verbrycke.[6] (*See also* CANCER, LABORATORY DIAGNOSIS OF.)

Shreds in Clear Urine.—The significance of shreds in urine depends upon their source (Gunn[7]). They are not necessarily indicative of organic stricture or of active gonorrhœa. Shreds from the *urethra* depend for their form on the amount of pus present. Large amounts produce irregular droplets, smaller ones give rise to flat moulds of the grooves into which the empty urethra folds. They consist of epithelium, pus cells, mucus, and bacteria; the latter, in the order of frequency, are gonococci, staphylococci, a coarse bacillus, a diphtheroid bacillus.

The abnormal threads from the anterior urethra are comma-shaped and composed of pus, mucus, and bacteria. Fine threads may come from the anterior urethra in perfectly normal subjects. These are composed of epithelium and mucus, with a few pus cells, and a few Gram-positive cocci, or large diplococci which react variably to Gram.

Five distinct types of shred come from the *seminal vesicles*, but only two are abnormal: the so-called casts, and the long thin threads from the ejaculatory ducts. Both contain pus cells and bacteria; spermatozoa are present only in small numbers.

Two kinds of threads come from the *prostate*: a large coarse pus thread from the inflamed ducts, and a comma-shaped thread from the ducts in the later stages of chronic prostatitis. The commonest organism in the latter case is the diphtheroid organism.

The following method of *staining urinary deposits* was devised by Schott.[8] Two solutions are required: 5 per cent water-soluble aniline blue in distilled water, and $2\frac{1}{2}$ per cent eosin in glycerin containing 5 per cent carbolic acid. To the urine are added three drops of the first, and six drops of the second, and the mixture is centrifuged. The leucocytes appear blue-violet to red, red cells brown to eosin red. The nuclei of the epithelial cells take on the stain.

Senator's Method is highly recommended by Edelmann and Karpel.[9] A drop of the deposit is spread on a slide and carefully dried. One

drop of Ehrlich's triacid stain is left on for ten minutes, washed first with water, then with alcohol. After drying, the preparation can be mounted in balsam. The hyaline casts and cell-bodies come out violet, the nuclei of the cells bluish-green, and the red cells orange. The authors quoted recommend treating the urine with a few drops of sodium bicarbonate until the reaction is slightly alkaline to litmus. A slide is prepared from the deposit after centrifuging, and fixed by heating to 100° C. The Senator technique is then followed.

If Leishman staining is desired, the urine must not be alkalinized. The films should be fixed in acetone for five minutes. The epithelial cell-bodies stain a dirty-red colour, which is more intense in those derived from the kidney. Chromatin structure can be made out in the nuclei. Micro-organisms come out very well.

The Diagnosis of Liver Disease. — C. Chase[9] has employed the *urobilinogen* and *lactose* tests. He asserts that if the former be positive, it indicates localized disease in the liver; while the second test indicates general liver degeneration such as might occur in the course of infectious diseases.

1. *The Urobilinogen Test.*—This is carried out by adding to 2 c.c. of fresh urine 1 or 2 drops of the following solution:—

Paradimethylaminobenzaldehyde	4 grams
Hydrochloric acid	40 grams
Water and a few drops of alcohol to ..	200 c.c.

In the presence of urobilinogen, a rose-red colour develops, usually in the first few minutes. If bile-pigment is present, it is necessary to shake the mixture with a little chloroform, when the colour will appear in the bottom of the tube. The presence of this substance in urine indicates that there is some disease in the liver or bile-passages. Deep jaundice with a negative urobilinogen reaction would imply complete occlusion of the common bile-duct. This test is one of the greatest aids in the diagnosis of complicated kidney, liver, and heart diseases accompanied by ascites. If under treatment with digitalis, urobilinogen and albumin diminish in the urine; that is, if the liver and kidney conditions improve, the primary trouble is indicated in the heart. If the urobilinogen remains unaltered in quantity and the albumin becomes less, the liver is indicated as the probable causative agent. If the urobilinogen is diminished, and the albumin and casts are unaltered, the kidney is probably primarily diseased.

As soon as liver degeneration takes place in the course of an infectious disease, such as pneumonia, tuberculosis, or typhoid, the change can be detected by observing the presence of urobilinogen.

2. *The Lactose Test.*—Forty grams of lactose are given in tea in the morning after free purgation. In health there should be no sugar in the urine after the first hour, but if the liver cells are diseased it will appear for from three to fourteen hours after. It is detected by Fehling's test.

The following table from Chase's article shows the conclusion which can be drawn from the combined use of galactose and urobilinogen.

Disease.	Lactose Test	Urobilinogen Test
Hepatic congestion	—	+
Cholelithiasis, complicated	—	+
Compression and obstructive icterus	—	+
Neoplasms	—	+
Carcinoma	—	+
Gumma	—	+
Echinococcus	—	+
Cirrhosis	+	+
Alcoholic	+	+
Biliary	+	+
Banti's liver (syphilis)	+	+
Hepatitis	+	+
Catarrhal icterus, infectious	+	+
Acute yellow atrophy	+	+
Poisoning	+	+
Phosphorus	+	+
Chloroform	+	+
Lead, etc.	+	+
Toxic parenchymatous degeneration of infectious diseases	+	+

References.—[1]*Jour. Amer. Med. Assoc.* 1911, ii, 1193; [2]*Glasg. Med. Jour.* 1912, i, 425; [3]*Med. Chron.* 1911, ii, 140; [4]*Amer. Jour. Med. Sci.* 1912. i, 221; [5]*Brit. Med. Jour.* 1912, i, 1064; [6]*Med. Rec.* 1911, ii, 876; [7]*Med. Press and Circ.* 1912, i, 399; [8]*Deut. med. Woch.* 1912, 1271; [9]*Jour. Amer. Med. Assoc.* 1912, ii, 329.

UTERUS, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Hysterotomy.—Beaver[1] recommends opening the uterus to clear up diagnosis in difficult cases. He has himself performed the operation in fourteen cases, and finds it especially useful in early malignant growth of the body, or of small polyps which are liable to be missed by the curette, also for removing single submucous myomata. Treatment appropriate to the condition can at the same time be carried out.

Amenorrhœa with Adiposity.—Casalis[2] operated on two patients, both young women, in whom there was great excess of fat in the anterior abdominal wall, forming a markedly protuberant and pendulous abdomen. In each there was a long period of amenorrhœa, associated with the deposit of abdominal fat. He performed the operation of **Abdominal Lipectomy** as reported by Kelly. Following operation, menstruation became regular and normal in each case.

Dysmenorrhœa due to small Fibroids.—Wilson[3] has met with three cases of very small fibroids in the region of the internal os, associated with severe dysmenorrhœa. **Hysterectomy** in two cases, and **Vaginal Cœliotomy** with enucleation of the fibroid in the third case, resulted

in complete relief of symptoms. He attributes the pain to obstruction by the minute tumour in the upper part of the cervical canal.

Double Uterus.—Faulty development of the uterus is frequently associated with conditions of dysmenorrhœa, and if pregnancy occurs it often terminates before term. Strassman[4] has collected some cases in which **Operative** measures have been attempted to correct the deformity. In a case of his own of complete double uterus and vagina, in which the patient suffered from dysmenorrhœa and had previously aborted frequently, he adopted the following procedure: The septum in the vagina and cervix was cut so as to form a single canal, and then he brought down the two horns of the uterus to the vulva through an anterior vaginal cœliotomy wound. The inner half of each horn was removed down to the point at which the cut septum in the cervix was reached. The anterior walls of each horn were then united, and subsequently the posterior walls, thus forming a single-chambered uterus, which was replaced in the abdominal cavity. Eighteen months after the operation the patient had a spontaneous breech delivery of a living child.

He also records a case by Puppel, in which the two halves of a bicornuate uterus were fused by a similar procedure, but through an abdominal section. This patient aborted in the subsequent pregnancy.

Cœliotomy and Early Rising.—For the last two years Wallace[5] has allowed his hospital patients who have undergone the ordinary gynæcological operations to leave their beds when they felt inclined. He found that the majority rose on the seventh day, and he has been so satisfied with the results that it has become the usual routine, and the question now is not, Which patient shall get up? but, Who is to be kept in bed? Among those who rose early there were three patients who developed a phlebitis, so that early rising does not prevent this complication. Although the majority are up on the seventh day, they are not discharged until the sixteenth day.

Pelvic Surgery and Hæmostasis.—Worral[6] made notes of the technique of ligation of vessels in pelvic surgery by various surgeons on the Continent and in England, during a recent tour. He found the technique the same with one or two exceptions: the structure containing the vessels (broad ligament, omentum, mesentery, etc.), was either transfixed by various needles, tied, and cut, or clipped by pressure forceps, the growth or organ cut away, and the transfixing process resorted to. On many occasions important vessels were wounded by the transfixing needle; once the external iliac vein, sometimes the uterine artery, and on innumerable occasions, the veins of the broad ligament. He, personally, in over 2,000 abdominal sections, has relied solely upon exposing, clipping, and tying all vessels with catgut ligatures, and has had no case of secondary hæmorrhage. He comes to the conclusion that the method of transfixing defeated its own object, in that one interlocking loop tended to pull the other loop off when the structure was pulled upon. He thinks catgut the best material for ligatures; during his six months in England he saw five dangerous operations

for suppurating abdominal sinuses caused by infected silk ligatures, and it is worthy of note that in none of these was the actual surgeon the original operator.

Fibroma of the Pelvic Fascia.—McCann[7] and Malcolm[8] each records treatment of huge tumours of many years' growth, forming at the same time an abdominal swelling continuous by an isthmus with a larger mass projecting from the perineum. Both were simple fibromata showing cystic myxomatous degeneration. McCann's patient recovered, but Malcolm's case, with a much larger tumour which had descended from the abdomen, and into which the rectum was found to penetrate for some distance, did not recover from the operation.

Carcinoma.—During the year a number of papers have been published on cancer of the uterus. They all agree in the advantages of early diagnosis and the good results to be obtained from **Radical Operation.** The figures bring out a lowering of the immediate mortality for the radical operation as the technique and skill of the surgeon improve. Farrar Cobb,[9] Porter,[10] Lund,[11] and Graves[12] publish results bearing out the above statements. A fact of much significance is brought out in connection with operations on cases of carcinoma of the cervix too advanced for Wertheim's radical treatment. In these it is seen that the mortality of the abdominal route for simple hysterectomy, owing to infection of the peritoneum by the foul growth, is higher than that of vaginal hysterectomy.

Young's[13] review of Schottlaender and Kermauner's monograph on carcinoma of the uterus, notes that cystoscopy is of negative value in determining operability of a case; the causes of death following operation were, in their order of frequency: peritonitis, sepsis, and shock (about equal), and much less frequently, hæmorrhage, pyelo-nephritis, pulmonary embolism, pneumonia, and reflex anuria; 50 per cent of the deaths were due to infection. The absolute recovery in all cases was 36·2 per cent, and of those surviving operation, 75 per cent remained cancer-free.

Ryall[14] has tied the internal iliac and ovarian arteries in twenty cases of *advanced carcinoma* of the uterus. This palliative measure has afforded a relief from hæmorrhage, and no untoward result has occurred. Where the growth is extensive, and associated with much foul discharge, he has at the same time cauterized the cervix extensively.

Menstruation after Curettage.—The question of the time at which the period may be expected after a curettage is often of some practical importance. Jaeger[15] has made observations in twenty-five cases of "endometritis," from which one learns that the period came on at the normal and expected time in 64 per cent. In 12 per cent it was two days too late, in 4 per cent two days early. In the remainder the period was considerably delayed, or very early. The observations may therefore be taken to support the theory that menstruation does not depend upon the condition of the endometrium, but upon ovarian activity.

With regard to the establishment of menstruation after the uterus has been curetted for incomplete abortion, the following figures illustrate the facts: In 64 per cent the period ensued between twenty-one and twenty-eight days after the curettage, and in 28 per cent between twenty-nine and thirty-five days.

Radium (*pages* 62, 66) and **Ionization** (*pages* 72, 73) are also used in the treatment of certain uterine diseases.

REFERENCES.—[1]*Jour. Amer. Med. Assoc.* 1912, ii, 90; [2]*Jour. Obst. & Gyn.* 1912, Jan.; [3]*Brit. Med. Jour.* 1911, ii, 996; [4]*Beyl. klin. Woch.* 1912, 1750; [5]*Jour. Obst. & Gyn.* 1912, May; [6]*Ibid.*; [7]*Proc. Roy. Soc. Med. V.* No. 1; [8]*Ibid.*; [9]*Bost. Med. & Surg. Jour.* 1912, ii, 37; [10]*Ibid.* 45; [11]*Ibid.* 47; [12]*Ibid.* 48; [13]*Jour. Obst. & Gyn.* 1912, Aug.; [14]*Clin. Jour.* 1912, i, 273; [15]*Zentralb. f. Gyn.* 1911, No. 38.

VACCINATION. *E. W. Goodall, M.D.*

It is pointed out by Schamberg and Kolmer[1] that "the best possible protection to the vaccinal ulceration is afforded by the formation of a hard concrete crust due to desiccation of the contents of the vaccine vesicle and pustule. Such a crust will form, unless there are undue inflammation and suppuration, and unless the crust is subjected to mechanical violence calculated to loosen or detach it. There does not seem to be an ideal dressing for the vaccinal lesion, i.e., one that will lessen the liability of the vesicle to rupture, and will of itself act as an antiseptic."

In view of the fact that solutions of **Picric Acid** combine with the keratin of the epithelium of the skin to produce a hardening effect, the authors determined to ascertain the germicidal property of the acid, thinking that if it was satisfactory it would serve as an excellent application for the wound produced in vaccination. They found that picric acid was a highly efficient germicide, especially in alcoholic solution (4 per cent). They were unsuccessful in their attempt to ascertain the depth of penetration of the solution of picric acid into the skin. Subsequently a clinical trial was made in 22 cases of vaccination in children convalescent from scarlet fever. A 4 per cent solution of picric acid in 95 per cent alcohol was painted over and around the vaccinal site forty-eight hours after the insertion of the lymph. The paintings were continued daily. The authors came to the conclusion (so far as they were justified by the small number of cases): that the treatment did not interfere with the success of the vaccination; that it lessened the degree of local inflammation; that it hardened the epithelial covering of the vaccinal lesion; and that it produced a decreased liability to extraneous bacterial infection.

In a recent paper Simpson[2] publishes an account of experiments made by him seventeen years ago, in India. Directly he arrived in India in 1886 he began to search for cases of cow-pox amongst cattle, because he was anxious to undertake investigations with the view of discovering the organism of vaccinia. He found that cow-pox was a severe disease, being generalized instead of localized—that is, small-pox, and not cow-pox proper.

During several years' search amongst cases of "gotee" (*Bengal cattle plague*) in animals, Simpson had isolated a diplobacillus. In 1894 from a buffalo suffering from gotee with a generalized eruption, he isolated a diplobacterium similar to that previously obtained. With subcultures of this organism, Simpson, in November 1894, inoculated two calves. Local vesicles were produced; the lesions were transmitted through two other calves successively, and from the last of these to an unvaccinated human infant, in whom typical vaccine vesicles were the result. From this infant others were successfully inoculated, and all failed to react when inoculated with ordinary vaccine lymph. These experiments were expanded in various ways, such as by re-transferring the lymph from the children on to calves, again from calves to children, and from children to children.

From another set of experiments it would appear that by inoculation of cultures from a case of general small-pox in a buffalo, general small-pox was set up in a calf, from which calf cow-pox (vaccinia) was transmitted by inoculation to calves and children.

REFERENCES.—[1]*Lancet*, 1911, ii, 1397; [2]*Jour. Trop. Med.* 1912, 209.

VAGINA, DISEASES OF. *Victor Bonney, M.S., M.D., B.Sc., F.R.C.S.*

Vulvo-vaginitis.—Chapple[1] has treated two cases of vulvo-vaginitis in which a growth of the pneumococcus was obtained. One case was treated with a pneumococcus **Vaccine** and **Vaginal Douching,** with rapid recovery.

Vaginismus.—Funck-Brentano,[2] when treating aggravated cases of vaginismus, introduces a small champetier de Ribes bag (5 to 6 c.cm. diameter), into the vagina, inflates it, and draws it into the vulval outlet. He then excises the hymen as it lies flattened out on the bag, which is next delivered slowly, the greatest care being taken not to cause laceration of the vaginal outlet. He then introduces a larger bag, 7 to 8 c.cm., and slowly delivers it. The edges of the hymen are not sutured. The vagina is packed for twenty-four hours and then douched. The results he finds excellent.

Persistent Cloaca.—Hosmer[3] operated on a healthy child, well developed with the exception that the rectum opened into the vagina. An incision was made through the posterior vaginal wall and round the gut orifice, and the gut dissected free from its attachments to allow of its being drawn down and fixed in the proper site and stitched to skin margins. The posterior vaginal wall and perineum were sutured. A perfect rectum, perineal body, and vagina resulted, with no subsequent trouble.

Absence of Vagina.—Dreyfus[4] dissected up the septum between the rectum and bladder until he reached the tumour above formed by the retained products, which he drew off. He then packed the wound with gauze, and at a subsequent operation used the complete sac obtained from a man with inguinal hernia, inserting it into the wound to form a lining for the artificial vagina. The sac grew well in its

lower part, but the upper end failed; nevertheless a satisfactory vagina was obtained.

Stoeckel[5] in one case attempted to form an artificial vagina by drawing down the peritoneum which had been cut in flaps, and which lined Douglas' pouch. These flaps were drawn through the passage made in the recto-vesical septum, and stitched to the skin edges. Unfortunately the vagina contracted in spite of constant tamponment, until it would admit only the little finger. In a second case, he performed Baldwin's operation, and the immediate result was good.

Prolapse.—Hirst[6] describes an operation for prolapse which he has found invariably successful. It is intended to repair the injuries to which prolapse owes its origin, which he classifies under three heads: (1) Stretching, with possible laceration of the uterine ligaments, in the bases of the broad ligaments which support the cervix, lower uterine segment, and indirectly the vaginal vault; (2) Complex injury of the anterior vaginal vault; (*a*) lateral separation and stretching of the fascial plate derived from the bases of the broad ligaments extending down between the bladder and vagina; and (*b*) a laceration of the muscle and fascia of the urogenital trigone.

The **Operation** consists in seizing the cervix and pulling down the uterus, when the anterior vaginal wall is incised in its whole length and the incision continued circularly round the cervix. The cervix is amputated above the internal os, and the cervical canal dilated. Next, a suture is passed with the point downwards through the base of the left broad ligament, then transversely through the anterior wall of the uterus, and then through the base of the right broad ligament. By making this suture tense, and pushing the detached bladder up, the lateral edges of the dislocated fascia are plainly marked, and are brought together in the middle line with sutures, usually four in number. The redundant vaginal wall is cut away. The sutures for an amputated cervix are inserted and tied, and the edges of the anterior vaginal wall are united by suture over those joining the pelvic fascia. Finally, the posterior vaginal wall and pelvic floor are strengthened by an extensive posterior colpoperineorrhaphy.

References—[1]*Lancet*, 1912, i, 1685; [2]*La Gynæcol.* 1912, Oct.; [3]*Surg. Gyn. & Obst.* 1912, Mar.; [4]*La Gynæcol.* 1912, Apr.; [5]*Zentralb. f. Gyn.* 1912, No. 1; [6]*Jour. Amer. Med. Assoc.* 1912, i, 846.

VENEREAL PROPHYLAXIS.

(*Vol.* 1912, *p.* 583)—The following methods are used in the U.S. Navy, with effective results. In those who have been exposed to infection the entire penis is scrubbed with liquid soap and water for several minutes, and then washed with **Mercuric Perchloride** lotion, 1–2000. Any abrasions are sprayed with **Hydrogen Peroxide.** Two urethral injections of **Argyrol** (10 per cent) are then given and retained for five minutes. The whole penis is then rubbed with 33 per cent **Calomel** ointment, which is kept on for several hours.

VERRUCA PERUANA.

Leonard Rogers, M.D., F.R.C.P.

S. T. Darling[1] records an interesting description of this Peruvian disease, which is also known as Carrion's Fever, in honour of Daniel Carrion, who established the relationship of the fever to the later

warty eruption by inoculating himself with the latter, and dying of the former as a result. It is an infectious disease, beginning with irregular fever of a severe and often fatal type, and followed in the milder cases by a wart-like eruption on the skin, but also sometimes affecting mucous and serous membranes. It occurs only in certain deep valleys in the western side of the Peruvian Andes, oftenest at a height of from 2000 to 6000 feet; it caused a high mortality among imported labour during the construction of the Oroya railway, and is therefore often called *Oroya fever*. In acute severe infections there is high remittent fever with rapidly progressive severe anæmia of the pernicious type, accompanied by leucocytosis, which is most marked after the fever has lasted some time and become irregularly remittent or intermittent. In the small percentage of patients who recover from the febrile stage, a later eruptive stage ensues with purple papules developing into warty growths, lasting four to six months, but usually ending in recovery. The fever is said to have a mortality of 10 per cent in natives and 80 to 90 per cent in Europeans. In 1905, Barton described bacillus-like elements in the red corpuscles, believed to be the cause of the disease, which disappear from the peripheral blood during recovery, and are probably a unique type of micro-organism. The disease is believed to be contracted at night in some as yet unknown way.

H. A. Giltner's[2] account is very similar to that of Darling, above. He notes that the lower animals are also liable to infection. The disease in some respects resembles yaws. Death most frequently occurs between the twenty-fifth and thirtieth days. There is in the majority of cases an interval of two to five months between the fever and the appearance of the eruption. There is a miliary eruption, and a globular form, the latter varying from the size of a hazel nut up to that of an orange. The disease is not communicable from one patient to another outside the endemic area. Treatment is of little avail, but **Saline Solutions,** per rectum and intravenously, have been used to great advantage during the critical part of the febrile period.

REFERENCES.—[1]*Jour. Amed. Med. Assoc.* 1911, ii, 2071; [2]*Ibid.* 2074.

VISCEROPTOSIS. *Robert Hutchison, M.D., F.R.C.P.*

Richard R. Smith[1] has made a careful study of 109 female children below the age of thirteen with reference to the occurrence and pathogenesis of visceroptosis. He found that actual prolapse of the viscera is very rare in childhood, but on the other hand the "enteroptotic habit" of adult life finds its counterpart in the frail child with lack of fat, and poor muscular development. He is of opinion that the "habit" is of far greater importance in women than the actual displacement of viscera which accompanies it, and he believes that much might be done in the way of prevention by careful attention to the "frail" children who are predisposed to visceroptosis.

Murray Leslie[2] has written a full clinical paper on visceroptosis and its treatment. As regards causation he believes in a congenital factor

in many cases, but admits that repeated pregnancies, constricting bands, and wasting diseases may all be exciting causes. He is an enthusiastic but uncritical supporter of Arbuthnot Lane's well-known views on intestinal stasis and the development of "kinks" and adhesions, but merely reiterates their originator's assertions on these matters. In diagnosis he attaches great importance to **Radiography.** In treatment he recommends **Physical Exercises,** the avoidance of constipation, the maintenance of a good state of nutrition, and the use of proper corsets as the best preventive measures. When the condition is fully developed, he advocates improvement of nutrition (by a **Rest-cure** if necessary), **Abdominal Exercises, Massage,** the correction of constipation by small doses of **Cascara** after meals or of **Liquid Petroleum,** and sleeping with the foot of the bed raised. He strongly supports the use of a properly-fitted **Belt** or **Belt-corset** which exerts pressure on the lower abdomen but is loose above, but he deprecates the use of "kidney" belts and trusses. Surgical treatment is only to be adopted after the above hygienic, dietetic, and medicinal measures have failed. Here again he is an enthusiastic believer in Mr. Lane's procedures.

T. R. Brown[3] has investigated the *state of the secretion* in forty cases of gastroptosis, and has arrived at the following conclusions: (1) While in individual cases of gastroptosis we may meet with varying amounts of free hydrochloric acid, ranging from a condition of achlorhydria to one of hyperchlorhydria, nevertheless the tendency in the majority of these cases is towards a distinct diminution of the free acid. (2) The extent of this diminution is dependent upon the amount of downward displacement of the stomach, the diminution being slight in the cases of slight descensus; but very marked, with a tendency to complete disappearance, where the ptosis is great. (3) The fact that so many of the patients with marked ptosis show a complete absence of free hydrochloric acid suggests that gastroptosis may be one, if not the most important, causative factor of achylia gastrica (so-called). That this achlorhydria is functional in a large proportion of these cases is shown by the fact that under the appropriate treatment, overfeeding, a proper dietary, rest at appropriate times, the wearing of a suitable support, and postural treatment, in conjunction with the administration of **Hydrochloric Acid** by mouth, there is usually a return of the free hydrochloric acid after the test meal, although it may require persistence along this line of treatment for many months before this occurs.

References.—[1]*Jour. Amer. Med. Assoc.* 1912, 385; [2]*Clin. Jour.* 1912, 49; [3]*N.Y. Med. Jour.* 1911, 571.

VISION, DEFECTS OF. *A. Hugh Thompson, M.D.*

Fields of Vision in Cerebral Tumour.—An important contribution to this subject will be found in papers by Harvey Cushing and Heuer,[1, 2] recording the results of perimetry in 200 cases of cerebral tumour surgically treated, observed during a period of five years. Reliable

charts were secured from 123 patients. Of these, 27 showed practically normal fields. In 95 cases, i.e., nearly one half of the entire number, and 77 per cent of the cases in which the fields could be taken, there were abnormalities of diagnostic value. In 42 cases characteristic defects occurred which were of definite aid in localization. The charts of the other 53 cases showed fairly symmetrical interlacing, with more or less tendency toward inversion of the colour fields, accompanied by constriction of the fields for form—an indication of an increase of pressure.

"The 27 cases with normal fields practically all occurred in the second 100 cases of the series—an evidence of the growing tendency towards more precocious diagnoses before symptoms have advanced to a high degree. Naturally, normal fields will more often be observed when the tumour primarily involves an area which promptly gives localizing symptoms. This is particularly true of early pontine tumours (two cases), of many tumours whose first symptom is Jacksonian epilepsy (seven cases), of early intracerebellar or lateral recess lesions (six cases), and particularly of early hypophyseal growths or hyperplasias which have not reached the point of giving either general pressure or serious neighbourhood symptoms (seven cases)."

With regard to the cases with abnormal fields, "interlacing proves to be one of the most constant, and occasionally the earliest, of the signs of an increase in pressure. In a number of cases the condition has preceded a demonstrable choked disc, and furthermore, when accompanied by the latter, it has been very commonly observed that the inversion and interlacing disappear after decompression before there is any considerable subsidence of the neuro-retinal swelling." (*Figs.* 109, 110.)

The remaining cases with abnormal fields showed, with or without interlacing and inversion of the colour fields, hemianopsia belonging to one of three types: (1) Those with a tendency to bi-nasal loss of vision, with some preservation of the temporal fields (twelve cases, mostly of subtentorial growths leading to symmetrical changes in the two nerves, due to secondary atrophy without any direct implication of the visual pathway itself); (2) Those with a tendency to bi-temporal blindness (six cases); and (3) Those with a homonymous defect, either hemianopic, quadrantal, or, what is far more common but just as valuable for diagnostic purposes, a fragmentary homonymous constriction (twenty-four cases).

The authors explain that in tumours, the perimetric deviation is a slowly progressing one, and more or less complicated in many instances by the constriction of the fields consequent upon the alterations secondary to an accompanying choked disc. Hence the clear-cut vertical meridians characteristic of hemianopia due to vascular disease are not to be expected.

Night Blindness associated with Xerosis Conjunctivæ.—Stephenson[3] finds that this affection is specially common among poor-class children, and is prevalent during summer and autumn, but absent during the

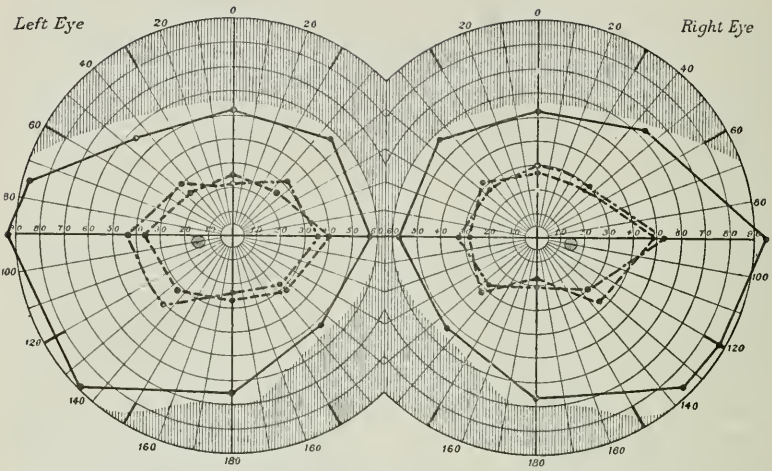


Fig. 109.—Charts of Case 1 before operation, showing characteristic blue and red interlacing, with some constriction of colour-fields.

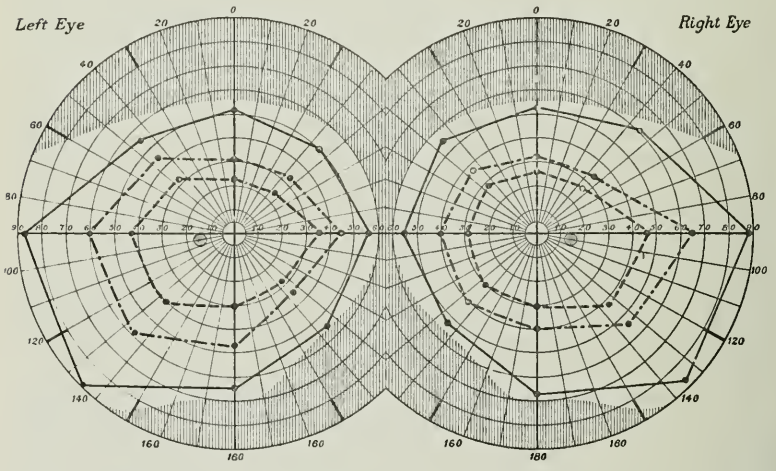


Fig. 110.—Charts of the same case after operation, showing restoration of normal colour relations after tumor removal.

(The continuous black line represents the field for white in each case, the interrupted line with dots the field for blue, which is normally larger than that for red, represented by the interrupted line without dots.)

winter months. In all affected children the blood was found to be deficient in hæmoglobin, a condition improving *pari passu* with that of the eye. In explanation of the facts, he points out that the white patches on the conjunctiva are found only on those parts exposed to light when the eyes are open; that *B. xerosis* is an almost constant inhabitant of the conjunctival sac, and, while finding in the white patches favourable conditions for growth, has no causal connection with them; that under the influence of light the metabolism of the exposed parts undergoes an alteration; and that the remote cause is to be sought in some slight defect of nutrition. That the connection between the conjunctival condition and the retinal torpor which is the explanation of the visual defect, is not merely accidental, is further shown by the following observation, that in children with xerosis but without ascertainable night blindness, there exist changes in the visual fields of two kinds: a constant reduction in the red and green fields, and more in the red than the green; and an occasional slight contraction of the fields for white.

References.—[1]*Johns Hop. Hosp. Bull.* 1911, June; [2]*Jour. Amer. Med. Assoc.* 1911, ii, 200; [3]*Brit. Jour. Child. Dis.* 1911, 529.

VOMITING, ANÆMIC. *Herbert French, M.D., F.R.C.P.*

A. P. Beddard[1] again draws attention to the fact that anæmic vomiting in girls and young women produces symptoms which are sometimes difficult to distinguish from those of gastric ulcer. The point is important, and the following description of the condition is given largely in Beddard's own words.

The Symptoms of anæmic vomiting are pain in the epigastrium and vomiting. Almost everything placed in the stomach gives rise to the pain, which is relieved by the vomiting; it is obvious that these symptoms are common to a large number of conditions. They are probably due to hyperæsthesia of the mucous membrane of the stomach, which in turn is due to dilatation of the heart. An active stretching of the cardiac muscle is a common process in anæmic girls, especially when they have to do comparatively hard work. This process is frequently associated with severe pain and tenderness referred to two parts of the body: (1) The skin and muscles under the left breast. Many of these patients complain of this pain; in others the tenderness is demonstrated only by firm palpation. There is nothing the matter with these structures, although they may be so tender that the patient cannot bear her clothes to touch them. (2) The mucous membrane of the stomach. This may become so hyperæsthetic that whatever touches it causes pain, and the stomach to empty itself. Again, the mucous membrane is perfectly healthy, although it is so hypersensitive. If pain is thus referred from a stretching heart to the stomach, it follows that anything which suddenly increases the stretching process will increase the pain in the stomach and lead to vomiting. We therefore find in anæmic vomiting that any exertion like running upstairs, is liable to bring

on the same pain and vomiting as food; if the exertion is long and arduous, the attacks may be so severe as roughly to simulate perforation of the stomach.

These very severe attacks, which may induce the unwary to open the patient's abdomen, are in many respects comparable to the gastric crises of locomotor ataxy. In both conditions pain is referred to the mucous membrane of a stomach which may in itself be perfectly healthy, and yet the hyperæsthesia be so great as to lead to severe and prolonged attacks of vomiting.

Diagnosis from Gastric Ulcer.—Pain after food, relieved by vomiting, in a young and often anæmic young woman, suggests the possibility of a gastric ulcer. The importance of making a correct diagnosis is considerable: (1) The medical treatment of the two conditions is almost diametrically opposite; (2) It is obviously a serious error to operate upon a case of anæmic vomiting, just as it is upon a case of gastric crisis. There can be little doubt that we all not infrequently diagnose gastric ulcer when none is present. Surgical and pathological evidence shows that gastric ulcer is not so overwhelmingly more common in the female than in the male sex as purely clinical diagnoses would appear to indicate. What, then, are these cases which we are liable to diagnose as ulcer and yet are not? Probably many of them are the condition which we are now considering.

The points on which a diagnosis has to be founded may be considered under the following heads:—

1. *Hæmatemesis.*—Any severe retching or vomiting may produce streaks of blood in the vomit. One has seen it in cases of gastric crisis. But a recent attack of hæmatemesis would be almost certain evidence of ulcer; even a history of past hæmatemesis would be a strong point in favour of that diagnosis.

2. *Pains and Vomiting.*—In cases of gastric ulcer the pain has a constant relation to food; it is more or less completely relieved by vomiting; and between the attacks of pain brought on by food, little or no pain is present, even on exertion. Further, most patients with gastric ulcers are clear that the degree of their pain depends very much upon the kind and quality of food they eat: that solid food gives them more pain than liquid, and so on. In cases of anæmic vomiting the pain is brought on or aggravated by food and may be relieved or lessened by vomiting. But these patients are equally definite that their pain and vomiting have not a constant relation to meals; that they may have some of their most severe attacks apart from food altogether; and that sudden exertion or being tired out will bring on the same pain as a heavy meal. Further, in some cases the stomach is so sensitive that the patients are aware that it makes very little difference to their pain what food they take. Liquid food, even water, may give them severe pain.

3. *Abdominal Tenderness and Rigidity.*—In cases of gastric ulcer, before perforation, the lesion of the stomach is confined to a small part

of the mucous membrane ; therefore the tenderness is correspondingly limited. Rigidity is a marked symptom, and may be present although the tenderness is but slight.

Cases of anæmic vomiting show an obvious contrast. The tenderness of the abdominal wall affects the whole area over which the stomach is represented ; it is often so extreme that the patient flinches every time the upper part of the abdomen is touched. And yet, in spite of this great tenderness, rigidity may be absent.

4. *Constitutional Disturbance.*—Nothing is more curious and obvious about anæmic vomiting than the almost complete absence of constitutional disturbance, although a severe attack may have lasted some hours. The temperature is normal and the pulse but little affected ; signs of collapse are absent. The essential point which enables one to recognize that operation is not required is the disproportion between severe pain and sickness on the one hand, and the almost complete absence of constitutional disturbance on the other.

5. *The Heart.*—If the ultimate cause of anæmic vomiting is stretching of the heart, it follows that we should examine the heart with care from the point of view both of diagnosis and treatment. The tenderness below the left breast has already been referred to. The other important point to ascertain is the size of the heart. Apart from the use of *x*-rays the only accurate method of doing this is to map out by light percussion the area of the deep cardiac dullness.

It should not be forgotten, of course, that the cardiac impulse may be apparently in its normal position, and yet the left border of the heart may be three inches outside the left nipple line as indicated by percussion. If the heart is found to be of normal size and no skin-tenderness is present, it is safe to conclude that the case is not one of anæmic vomiting. If, on the other hand, both skin-tenderness and dilatation of the heart are present, then the case may be one of that nature.

Treatment.—1. *Absolute Rest in Bed.*—The length of time in bed is determined chiefly by the size of the heart. These patients should not be allowed up until the heart has either returned to its proper size or cannot be made to contract further ; otherwise, when they get up, they relapse either at once or soon after they have returned to work.

2. *Diet.*—Very often one finds that these patients have given up first one kind of food and then another, until they are half starved. Since the stomach in this condition is healthy and nearly equally hyperæsthetic to all foods, we should aim at giving the patient the diet best for her anæmia and general state of health, namely, full diet. In most cases, after a day or two in bed on light solid food there is no difficulty in getting the patient to take three square meals a day. It is well to explain to the patient that her stomach is healthy ; that she has starved herself unnecessarily, and so increased her trouble ; that she needs plenty of solid food ; and that any discomfort which it gives her will soon pass off. It is only in rare cases that the stomach

has to be coaxed to tolerate solid food by beginning with small frequent doses of liquid nourishment, as in Lenhartz's diet, for a day or two.

3. *Drugs.*—In Beddard's experience, bismuth, alkalies, and similar drugs, which are of value in gastric ulcer, are quite useless in anæmic vomiting. The drug which he has found of greatest value is **Arsenic,** in doses of two drops of Fowler's solution three times a day. To this may be added at once, or in the course of a few days, 10 grains of **Citrate of Iron** and **Ammonia.**

REFERENCE.—[1]*Pract.* 1912, i, 353.

VOMITING IN CHILDREN. (*See also* INFANTILE DIARRHŒA; INFANT FEEDING; *and* PYLORUS, CONGENITAL STENOSIS OF.)

Frederick Langmead, M.D., M.R.C.P.

VOMITING IN INFANTS.

The ease and frequency with which infants vomit is well recognized. According to Cheinisse[1] this is related to the anatomical, histological, and physiological differences between the infantile stomach and that of adults. Habitual vomiting is commonly due to *overfeeding.* There are, however, several other conditions, which are often overlooked. Cheinisse emphasizes particularly the ill-effects of *underfeeding* in this respect. This "inanition vomiting," slight at first, may become so severe that nothing is retained; the milk which is returned is usually curdled, and often mixed with bile. It occurs not only in bottle-fed babies, but also in those fed on breast milk, if this is insufficient or the nipple too flat. In the case of artificially-fed babies, the defect may be too free a dilution rather than too small a volume. The diagnosis of the condition is by no means easy. The general state of the infant is the surest guide. In overfeeding, at least in the earlier stages, the baby is puffy and apathetic, the abdomen tight or doughy, and pruritus and eczematous or urticarial eruptions are common; whilst in underfeeding, the baby is pale, wasted, and restless. Height and weight are below normal, especially the latter. In the case of overfeeding, the weight remains high, and height is unaffected.

Hütinel, Barbier, and Lemaire have described cases where vomiting due to *intolerance for milk* in any form has been accompanied by grave constitutional disturbance and arrest of growth. [These cases have long been recognized by English observers, but all acknowledge their rarity.—F. L.]

Other cases appear to be due to *hyperexcitability of the nervous system.* The infants subject to this form have been described by Peiser as restless, irritable, and difficult to nurse, frightened at the least noise, sleepless, and changing colour rapidly. Slight pressure produces erythema. There is some hypertonicity of the muscles, and the abdominal wall is hard. In such babies, catarrh of the upper respiratory passages is accompanied by a strong spasmodic cough,

which often ends in vomiting. During the second month of life, tetany is not uncommon. In some families all the children suffer from this nervous vomiting, which persists in each case in spite of all treatment until the child is old enough for more solid food.

Treatment.—If vomiting be due to overfeeding, the first indication is obvious; it is to reduce the bulk of the food and regulate the meals. In more complicated cases, the condition is too intricate to respond to any one form of treatment, either dietetic or medicinal. The particular cause must be sought for and treated accordingly. Cheinisse recommends **Citrate of Soda** as the medicine which does the greatest good in the greatest number of cases. When vomiting is due to inanition in a bottle-fed baby, it is necessary to inquire carefully into the amount of milk the baby is receiving, and the degree of its dilution; in one who is breast-fed, into the amount of milk obtained with each feed. When a suitable quantity of food is given, the vomiting may cease soon, or may persist for weeks or even months, but is less severe than before, only a little milk being ejected. In either case, weight increases, and the infant's general condition improves.

In the rare cases of *total intolerance for milk*, it must be replaced by whey and cream mixtures, raw meat juice, or various forms of broth, or meat teas such as veal tea or beef tea. Hahn has obtained some success in infantile vomiting by thickening the milk with 6 per cent of gruel; and Czerny also states that a certain number of wasted vomiting infants do better if the usual liquid diet be replaced by one more or less solid.

On the supposition that *nervous vomiting* is due to increased sensitiveness of the gastric mucous membrane, Rott has employed **Cocaine** locally. He gives 10 c.c. of a ·01 per cent solution of the hydrochloride, five times daily, ten minutes before the bottle. Of four infants treated thus, three ceased vomiting within three days. In the fourth case, vomiting recurred after four days, but was less severe. He continues the treatment until six days after the vomiting has ceased.

Cyclical Vomiting.

Etiology.—The writer[2] considers that this condition occurs more often in girls than in boys. The greatest incidence is between the fifth and eighth years. The patient is usually pronouncedly neurotic and excitable; easily frightened, elated, or depressed; and sometimes subject to enuresis, night-terrors, nervous diarrhœa, or the like.

Pathogenesis.—In all recorded autopsies, five in number, excluding one on a doubtful case, fatty degeneration of the liver has been found. It is usually canary-yellow in colour, and microscopically shows extreme fatty change in the lobules near the portal canals. The writer considers the appearances characteristic. Slighter fatty changes are found in other organs. In four, slight inflammatory or necrotic changes were found in the stomach and intestinal mucosa. There is little doubt that the condition is due to a toxæmia; but its source is still to be sought. Mellanby and Sedgwick[3] have found that creatin is

excreted in excess between the attacks. This suggests a persistent liver inadequacy, and bears out the views of those who believe the liver is especially at fault, the toxæmia being a result of this defect. Whether the liver defect is inherent or due to the action of poisons absorbed from the gastro-intestinal tract, or elsewhere, is still uncertain.

Symptoms.—The bouts of vomiting do not recur at regular intervals, and vary greatly in their frequency, perhaps every few weeks, perhaps only once or twice a year. Each bout is preceded by a few days or hours of fretfulness, headache, nausea, and drowsiness. The tongue is coated, and the breath offensive, perhaps smelling of acetone. Constipation is usual, but occasionally there is offensive diarrhœa. The temperature is slightly raised in most cases, and is very high occasionally. The urine is diminished, and contains the acetone series of bodies.

The most important and constant feature is the *vomiting*, which is usually very distressing, occurring every few minutes in the worst cases, and accompanied by nausea and retching. Expulsion of the stomach contents affords no relief. The vomit at first contains food, later consists only of bile and mucus. After twenty-four or thirty-six hours, altered blood may be seen in it in small quantity, and multiple brown specks. Acetone may be detected by its odour. In mild cases the whole attack lasts only for a day or two, but it may be prolonged for a week or longer.

Abdominal pain is usually absent at first, but often makes its appearance later, as a result of the vomiting.

The appearance of the patient is characteristic in all but the mild cases. The cheeks are flushed; the eyes, bright at first, become sunken, and injected in bad cases. The skin is dry and flushed. The abdominal wall becomes concave. Wasting proceeds apace, and may be extreme. Restlessness is marked.

Symptoms ascribed to *acid-intoxication*, and somewhat like those of diabetic coma, form an important part of the clinical picture. The urine contains acetone, diacetic acid, and β-oxybutyric acid, and occasionally albumin and hyaline or epithelial casts, but never in great quantity. Mellanby[1] finds that creatin is constantly excreted in excess, its output gradually increasing for a few days before the attack.

The loss of fluid leads to great *thirst*. The tongue and throat are red and parched. No other objective signs of visceral disease are found except *enlargement of the liver*, sometimes to two or three inches below the costal margin. Jaundice is an occasional symptom.

Diagnosis.—Among the conditions which have to be distinguished from cyclical vomiting are meningitis, intestinal obstruction, and nervous and hysterical vomiting.

In *meningitis*, the headache is more severe. After a few days, if the condition persists, meningitis can be excluded without much difficulty in most cases, for no rigidity or paralysis supervenes. The vomiting is more severe in cyclical vomiting, and soon produces the abdominal

facies, moreover it is not explosive in character. Although acetone and diacetic acid may be found in the urine in all forms of meningitis, and may be detected in the breath if vomiting is severe, the symptoms of acid-intoxication do not obtrude themselves so obviously as in cyclical vomiting. The mental change is more profound in meningitis than in the worst cases of cyclical vomiting. Only rarely does coma develop from the drowsiness, and is then of the " diabetic " type, being ushered in by air-hunger, not by convulsions or bulbar symptoms.

Cyclical vomiting has often been diagnosed as *intestinal obstruction*, but this may be excluded by the absence of local signs, and by the use of an enema. Acid-intoxication symptoms may be seen in both, but if they precede the vomiting, their presence favours a diagnosis of cyclical vomiting. If very intense, so that the smell of acetone can be detected yards away, cyclical vomiting is again the probable diagnosis. It is extremely important to distinguish between them, for if a patient with cyclical vomiting be operated upon, a fatal issue is almost certain.

Bellingham Smith[1] has drawn attention to a variety of *nervous vomiting*, which may be mistaken for cyclical vomiting in its mildest form. In this condition the vomiting is chronic, persistent, and not periodic. During, or more often after, a meal, the child vomits, seemingly without effort or distress. It never leads to prostration or emaciation, nor is it accompanied by toxic symptoms. Like cyclical vomiting, it occurs in children of a highly neurotic type, and is comparable with the nervous diarrhœa to which such are subject. Probably both are indications of peristaltic unrest.

Hysterical vomiting must be considered also. It is likewise accomplished without distress, but, owing to the fact that it may follow every attempt at feeding, emaciation is sometimes extreme. It is not periodic. The mental attitude of the child, and the wanton way in which she fosters the vomiting, often suggest the correct diagnosis; moreover, there are no toxic symptoms.

It is questionable whether *bilious attacks* are not really miniature bouts of cyclical vomiting. They are, however, usually traceable to some indiscretion in dieting, or to contaminated food, whilst attacks of cyclical vomiting are unassociated with any particular form of food, and often start when careful dieting has been most rigidly enforced.

Post-anæsthetic poisoning differs from cyclical vomiting only in the fact that an anæsthetic has been administered; the symptoms and post-mortem appearances are identical. The subjects of cyclical vomiting are potential victims of post-anæsthetic poisoning.

Prognosis.—Although this disorder is not uncommon, only eleven deaths have been recorded, except through the intervention of an anæsthetic. After the attack has lasted a few days or weeks, the vomiting and symptoms of toxæmia end almost abruptly, the appetite returns, and the child quickly regains its usual weight. Migraine may supervene after puberty.

Treatment.—The essential treatment between the attacks is to obtain a satisfactory *daily evacuation of the bowels*. After diet and the

amount of fluid taken have been adjusted, it is still necessary in most cases to determine the amount of purgative required. The variety is of less moment. **Salines, Fresh Infusion of Senna Pods,** and **Liquid Paraffin,** are all satisfactory. The important rule to observe is *regular* administration. Plain wholesome food, avoiding excess in any one sort, and avoiding cakes, sweets, and the various tit-bits for which these children crave, should be adhered to. The regular administration of small doses of **Alkalies** appears to be beneficial in warding off attacks. *Treatment for an attack* should be directed to dilution or elimination of the poison. A **Brisk Purgative** should be given at first, and if drowsiness deepens, an **Intravenous Saline** containing a drachm of sodium bicarbonate to the pint (in addition to the salt) should be infused. As a rule, nothing can be retained by the mouth, and feeding by this route is impracticable. **Fluids,** such as weak tea or warm water, should be given freely, for if retained they dilute the poisons, if expelled they wash out the stomach, and so keep up elimination.

On the supposition that the condition is purely one of acid-intoxication, alkalies and glucose or lactose have been administered by the mouth, the bowel, and subcutaneously. The good effects are not striking.

Finally, the relationship between cyclical vomiting and post-anæsthetic poisoning must be borne in mind. Operations merely of expediency should not be undertaken on children in whose history repeated "bilious attacks" appear. When operation is essential, chloroform should not be employed, for it is the anæsthetic most likely to be followed by this group of toxic symptoms. A long period of preparation and starvation, with its attendant anxiety and fear, should be dispensed with. If practicable, glucose and alkalies may be administered for a few days before the operation to control the acid-intoxication moiety. The most suitable time for operation is soon after an attack; the most dangerous is when one is anticipated, for then the accumulation of toxins has reached its acme. Unless the prodromata are actually in evidence, the only guide to the proximity of an attack is the presence of a large amount of acetone, diacetic acid, and creatin in the urine.

REFERENCES.—[1]*La Sem. Méd.* No. 48, 1911, 565; [2]*Pract.* 1912, ii, 24; [3]*Lancet*, 1911, ii, 8; [4]*Ibid.* 1769.

WARTS.

(*Vol.* 1912, *p.* 586)—When too numerous to be treated one by one, these lesions are best destroyed by **Radium** and **X-Rays.** If not too numerous for individual treatment, freezing with **Carbon Dioxide Snow,** or **Ionization** with zinc or magnesium ions is to be preferred.

WHOOPING-COUGH. *Frederick Langmead, M.D., M.R.C.P.*

Fritz Rosenfeld[1] recommends a mixture containing **Medinal** and **Antipyrin.**

Urethane is also spoken highly of (*page* 44).

REFERENCE.—[1]*Berl. klin. Woch.* 1911, 1686.

WORMS, INTESTINAL. (*See also* UNCINARIASIS.)

Robert Hutchison, M.D., F.R.C.P.

1. *Thread-worms.*—Stettiner[1] records the case of a patient who had suffered from childhood from thread-worms, for which all the recognized methods of treatment had been carefully tried, but without success. In his fiftieth year he developed diabetes, for which he was put on a **Carbohydrate-free Diet,** with the result that the thread-worms permanently disappeared. He has since tried the same plan with success in four other cases. His hypothesis as to the *modus operandi* of the cure is that the thread-worms require a medium containing plenty of carbohydrate for their development.

2. *Tape-worms.*—Mendelsohn[2] reports very favourably on the use of **Filmaron** in the treatment of tape-worms (80 per cent of cures in twelve cases). The remedy was introduced by Kraft, and is the active principle of male fern root dissolved in castor oil. Chemically it has the formula $C_{47}H_{74}O_{16}$, and is known as **Aspidinofilicin.** The author has found it a harmless substance, easy to administer, and a powerful vermifuge; it is specially to be commended for children. He gives 10 grams (about one-third of an ounce) to adults, and from 5 to $7\frac{1}{2}$ grams to a child. Fifteen grams (more than half an ounce) have often been given to an adult without harm. If no stool follows within an hour of the administration, a purge should be given, e.g., half an ounce of castor oil.

REFERENCES.—[1]*Berl. klin. Woch.* 1912, 901; [2]*Ibid.* 1912, 1518.

WRY-NECK. (*See* TORTICOLLIS.)

XANTHOMA TUBEROSUM MULTIPLEX.

E. Graham Little, M.D., F.R.C.P.

Pollitzer and Wile[1] contribute a careful paper to the pathology of xanthoma tuberosum, which they regard as quite distinct from xanthoma palpebrarum. The greater portion of the fatty substance in the cells of xanthoma tuberosum is cholesterol, a lipoid which has certain selective staining properties with Sudan III. In diabetes and diseases of the liver, lipoids are present in the blood in greatly increased quantity; and the authors suppose that these lipoids pass out through the capillaries of the skin to some point of diminished resistance—where the blood-vessels are subject to special strain, e.g., elbows, knees, fingers—positions where the eruption is chiefly seen. Xanthoma tuberosum is thus an irritative connective-tissue hyperplasia, in which the extravasation of cholesterol, present in excess in the blood, serves as a stimulus.

Treatment is not touched upon, and is on the whole unsatisfactory. **X-Rays** have been recorded as producing a permanent disappearance of the eruption.

REFERENCE.—[1]*Jour. Cut. Dis.* 1912, 235.

YAWS. *Leonard Rogers, M.D., F.R.C.P.*

Treatment.—H. Alston[1] reports the results of 500 cases of yaws treated with **Salvarsan,** with 99·6 per cent of cures, of which 82 per cent were cured with a single injection. The two cases not yet cured were stubborn ones which had received only two injections at the time of reporting, but were already improved. Five relapsed and were again cured by a second injection. Formerly from 12 to 14 per cent of relapses occurred. There were four deaths among the patients, but none are attributed to the treatment. Mercury has no effect on the disease, while soamin and orsudan are far inferior to salvarsan. P. C. Flu[2] also treated 700 cases of yaws at Paramaribo with salvarsan, using first the intramuscular, and later the intravenous method. The symptoms disappeared with almost incredible rapidity. He also records that 400 to 500 mgrams of salvarsan had a very favourable action on "pian bois," the swellings disappearing in eight days. G. Rost successfully treated 1000 cases in the West Indies with salvarsan, in doses of from 0·6 gram in adults to 0·2 gram in children.

References.—[1]*Brit. Med. Jour.* 1912, Jan. 14; [2]*Münch. med. Woch.* 1911, 2373.

ZAMBESI ULCER.

(*Vol.* 1912, *p.* 590)—This, a sloughing type of ulceration occurring below the knee among field workers in the Zambesi delta, is much like the "naga" sore of Assam, which is readily cured by cold compresses of **Potassium Permanganate** solution (1 per cent)

Part III.—Miscellaneous.

PUBLIC HEALTH:

Including

I.—MEDICO-LEGAL AND FORENSIC MEDICINE.

II.—STATE MEDICINE (INCLUDING LEGAL DECISIONS).

III.—INDUSTRIAL DISEASES AND TOXICOLOGY.

EDITED BY JOSEPH PRIESTLEY, B.A., M.D., D.P.H.
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I. MEDICO-LEGAL AND FORENSIC MEDICINE.

MURDER BY ARSENIC POISONING.

An important case was heard during 1912 at the Old Bailey, when the trial of Frederick Henry Seddon and Margaret Ann Seddon, his wife, for the murder of Eliza Mary Barrow, took place. Frederick Henry Seddon was convicted, and Margaret Ann Seddon acquitted. The appeal by Henry Seddon against the conviction failed.

The expert evidence of Dr. Willcox and Dr. B. Spilsbury is noteworthy. It proved that Eliza Mary Barrow died of arsenic poisoning, and that a poisonous dose of arsenic can be extracted from fly-papers of a certain kind by steeping them in hot or cold water. No expert medical evidence connected Seddon with the administration of the poison to the deceased, nor with the extracting of the arsenic from fly-papers. Circumstantial evidence proved Seddon's connection with the crime. The presence of fly-papers in the house was admitted, but it was suggested for the defence that the deceased had accidentally drunk the water in which the fly-papers had been steeped.

The deceased had been buried in due course on a medical certificate of death from "natural causes," and it was only after exhumation of the body on suspicion that the crime was discovered.

LOCUM-TENENTES.

An important decision has been given by a County Court Judge during 1912, to the effect that a locum-tenens engaged for a definite period contracts to perform certain duties day by day, and that, if he be unable to perform those duties, his engagement terminates, *even when his inability is the result of illness or injury.* In this decision, it is laid down that the principle of law applying to master and servant does not apply in the case of a medical man and his locum-tenens. In the case of master and servant, illness does not interfere with a contract.

Medical Women.

It has been decided during 1912 that, under the Medical Acts, *all* registered practitioners have the same status, irrespective of sex.

Workmen's Compensation Act.

Several interesting decisions have been given during 1912 under the Workmen's Compensation Act, and these may, with advantage, be put on record for convenient reference, as follows :—

1. Disease versus Accident.

(*a*). *Appendicitis as an Accident.*—This was the case of Lawson *v.* Weardale Steel and Coke Company, heard on July 15th, 1912, when it was claimed that an attack of appendicitis was the result of an accident, by which the patient had received, it was alleged, a strain whilst at work. He died from the appendicitis, the appendix itself having burst. The preponderance of the medical evidence was to the effect that the alleged " strain " was the natural symptom of pain that occurs in a sudden attack of appendicitis, and the County Court Judge, following this medical view, held that there was no accident within the meaning of the Act. Judgment was, accordingly, given for the defendants.

[*Vide* also Medical Annual, 1912, p. 593, the case of Miller *v.* Londonderry Collieries Limited.]

(*b*). *Blood-poisoning as an Accident.*—This was the case of Chandler *v.* The Great Western Railway Co. A fireman cut his finger whilst at dinner and went to work on his engine, with the result that dirt and grease got into the wound, causing blood-poisoning, which necessitated amputation of the finger. The County Court Judge held that the blood-poisoning was an accident under the Workmen's Compensation Act, arising out of, and in the course of, the man's employment. This judgment was reversed on appeal, the Court of Appeal holding that, as infection might have got into the man's hand in a number of ways, there was no evidence that the man was the victim of an accident arising out of, and in the course of, his employment (March 12th, 1912).

(*c*). *Corn-cutting as an Accident.*—The question was raised as to whether the plaintiff, who met with an accident when cutting a corn, was cutting a corn partly to make herself more efficient for her work, and that, therefore, the accident was an accident for compensation under the Workmen's Compensation Act. The County Court decided that it was not, and gave judgment for the respondents (July 5th, 1912).

(*d*). *Chimney Sweep's Cancer as an Accident.*—An interesting case was heard on April 24th, 1912, when it was claimed that the plaintiff (a coal miner) had contracted an industrial disease known as chimney-sweep's cancer (epithelioma), a disease mentioned in the schedule to the Act, whilst following, and through following, the occupation of a coal miner. The County Court Judge held that the claim had not been proved, though he thought that the plaintiff's contention was right, viz., that he (the plaintiff) was not excluded from the provisions of the Workmen's Compensation Act merely because the disease was not contracted in the actual process of the work mentioned in the

parallel column of the Schedule opposite the word "epithelioma." but that the burden of proof rested with the plaintiff.

(*e*). *Diabetes as an Accident.*—In the case of SHELTON COAL & IRON CO. *v.* LEESE, application was made to terminate compensation, paid to a timberer, on the ground that he was able to work, and that the diabetes was due to natural causes and not to the accident, which consisted of internal injuries to the lower part of the body a few months previously. There was a great loss of flesh after the accident. Traumatism is a principal cause of diabetes. There was also fatty degeneration of the heart, one of the consequences of diabetes in a severe form. The application was dismissed, the Judge holding that the disease (diabetes) was due to the accident.

(*f*). *Hernia and Strain as an Accident.*—In the case of SMITH *v.* DUNLOP & CO., LIMITED, an important question was raised as to a slight hernia being aggravated by strain and becoming, therefore, an accident under the Workmen's Compensation Act for which compensation could be awarded. The plaintiff, in helping to replace a derailed hutch, strained himself, with the result that a hernia developed, incapacitating him for work. It was admitted, or proved in evidence, that the hernia existed prior to the strain, which aggravated it. Compensation was awarded by the Sheriff-substitute, and on appeal to the Court of Sessions, the judgment was affirmed (October 18th, 1912).

(*g*). *Heart Disease as an Accident.*—Compensation under the Workmen's Compensation Act was claimed for the death of a man who died from heart disease, alleged to be caused by the use of heavy hammers. On the day of his death he was engaged only in hammering some metal sheathings, and fell back whilst holding the metal with tongs. A medical assessor was called in, and the Judge held that the death was not due to accident, because, had it been so, death would have been instantaneous, whilst, in addition, the man was actually resting at the time of his seizure, and not engaged in heavy or indeed in any work (July 9th, 1912).

(*h*). *Infectious Disease as an Accident.*—(i) The case mentioned on p. 594 of the MEDICAL ANNUAL, 1912, was reversed on appeal, the Court of Appeal holding that the contraction of the scarlet fever at a mortuary was not an injury by accident arising out of, and in the course of, the man's employment within the meaning of the Workmen's Compensation Act, unless the particular time, place, and circumstances be proved (March 29th, 1912).

(ii) A case was heard at Folkestone, on May 21st, 1912, when a widow claimed compensation for the loss of her husband (an undertaker), who died from small-pox contracted from a corpse which he assisted in placing in the coffin, the cause of death not being told to the undertaker. Three other men, who assisted at the burial, developed small-pox afterwards. *Held*, that the applicant was entitled to compensation.

(iii) In the case of SUDDABY *v.* GOOLE JOINT HOSPITAL BOARD, a claim was made for the death of a daughter, a nurse, from enteric fever contracted at hospital from another nurse who had had an attack of the disease and had been treated in the residential block, taking her meals, it was alleged, during convalescence, with the other nurses. *Held*, that there was no accident under the Workmen's Compensation Act.

(iv) In the case of CARTLIDGE *v.* GRANT & SONS, heard Sept. 11th, 1912, it was claimed that the plaintiff (a bricklayer) was entitled to compensation under the Act for an attack of typhoid fever alleged to have been contracted whilst working at a cesspool, the typhoid fever being an "accident" within the meaning of the Act. The plaintiff, in laying a new wall (footings), came across an old and foul cesspool, which was, in consequence, cleaned out or partly cleaned out—a process which took two to three hours. The stench was most marked. The building of the new wall proceeded afterwards, some of the old bricks (contaminated with the contents of the old cesspool) being used again. The plaintiff's fingers became contaminated, and the filth was transferred to the man's mouth from his fingers. Within the ordinary incubation period (fourteen to twenty-one days), typhoid fever was diagnosed. The man was a healthy man previously, and no case of typhoid fever had occurred in his family. The history of the case as to time, place, and conditions was striking. The County Court Judge held that the typhoid fever was an accident under the Act, and awarded compensation accordingly.

(*i*). *Mosquito Bite as an Accident.*—In the case of DUCAS *v.* THE OWNERS OF THE S.S. "CAYO BONITO," the plaintiff was bitten on the eyelid by a mosquito at Antilles, Cuba, with the result that he lost the sight of his left eye from atrophy of the optic nerve, and claimed compensation under the Act. The County Court Judge held that, whilst the loss of sight was due to the mosquito bite, the plaintiff was not exposed to special risks from mosquitoes beyond those to which other visitors to the West Indies were subjected.

2. MISCELLANEOUS POINTS.—Other points bearing upon the subject of the Workmen's Compensation Act have been decided, viz. :—

(*a*). *Appeal Court*—that a workman may recover compensation, even where he has not given the statutory notice of accident, under certain conditions pointing to a reasonable cause for the delay (MOORE *v.* NAVAL COLLIERY COMPANY).

(*b*). *County Court*—that a County Court Judge has considerable powers which he may exercise if a reasonable operation is refused by a workman (DIXON *v.* HOUGHTON COLLIERY).

(*c*) *Court of Session*—that a medical referee's report is final (WALKER *v.* FIFE COURT COMPANY).

(*d*). *Court of Appeal* (*House of Lords*)—that, if a miner loses one eye by accident and is subsequently able to resume work at full wages, he is not necessarily entitled to have a declaration of liability made, i.e., the arbitration to be kept open, under which the employers will be held liable if cataract supervenes in the other eye.

(*e*). *Court of Appeal* (*House of Lords*)—that a County Court Judge has power to end finally an award under the Act, when and if he is satisfied that the incapacity resulting from an accident has finally disappeared ; or to keep the matter alive (i) by awarding a nominal payment, or (ii) by adjudging that a weekly payment be ended until further order.

(*f*). *Court of Session*—that, when an arbitrator requisitions the services of a medical assessor, he is entitled, if not bound, to accept the opinion of such assessor, when the consent of both parties is obtained to the examination of the patient, and that it is competent for a medical assessor to examine the patient and report his condition

to the Sheriff, under such circumstances, at the conclusion of the evidence, without submitting himself to cross-examination on the result of his examination—the "report" of the assessor being an "opinion."

(*g*). *County Court*—that the fact that a workman refused certain treatment (massage), which was ordered by the employer's medical experts but deemed inadvisable by the workman's medical attendant, was not an "unreasonable" act on the part of such workman (WINGER *v.* BAKER).

(*h*). *House of Lords*—that there was incapacity for work when a man had a physical defect which rendered his work unsaleable in any market reasonably accessible to him, and that in like manner there was a partial incapacity when his work was less saleable. [N.B.—Appeal Court's decision in BELL *v.* HUNT & SONS, LIMITED, reversed. *See* MEDICAL ANNUAL, 1912, p. 594.]

II. STATE MEDICINE, INCLUDING LEGAL DECISIONS.

BACTERIOLOGICAL DIAGNOSIS.

The importance and helpfulness of bacteriological examinations are becoming more and more recognized, and no medical practitioner can afford to ignore them. Especially necessary is bacteriological diagnosis in cases of tuberculosis and the carrying out of the "sanatorium benefit." It seems a favourable opportunity in the present MEDICAL ANNUAL to impress upon medical men the value of bacteriological diagnosis and its limitation, viz., that a *negative* result means nothing, i.e. is inconclusive. This limitation must be remembered not only in sputum examinations, but also in the examinations of throat and nose swabs, blood, and discharges, and in tuberculin diagnoses.

All blood examinations should include the paratyphoid as well as the typhoid (Widal) reaction, whilst the opsonic index to the tubercle bacilli may be of the greatest value in arriving at a true prognosis in tuberculosis cases. No medical officer of health's department is complete without a well-equipped bacteriological laboratory—at least for the ordinary routine examinations of suspected tuberculosis, diphtheria, typhoid, etc.

In this connection there are certain special points to be borne in mind by all medical practitioners, when taking the samples for examination, as follows :—

1. Sputum samples for tubercle bacilli should be those coughed up on rising in the mornings, and, in the case of hæmorrhage, those coughed up after the hæmoptysis has ceased.

2. Sputum samples for other germs than tubercle bacilli should be those coughed up after the patient has rinsed out the mouth and gargled the throat several times with cooled boiled water.

3. Blood samples should be taken from the second drops exuding from punctures made on the fingers (close behind the nails at the back) or on the lobes of the ears, in both cases after the skin has been carefully washed and thoroughly dried.

4. Samples should be unmixed with antiseptics or added preservatives.

5. All deleterious liquids and substances submitted for examination, if sent by post, should be sent by *letter post*, in a suitable and approved

sealed receptacle, securely placed in a strong wooden, leather, or metal case, containing an absorbent material, and marked " Fragile—pathological specimen."

Intercepting Traps in House Drains.

During 1912, the Departmental Committee appointed by the President of the Local Government Board, issued their Report, and the findings contained therein are noteworthy. A large amount of evidence was taken, and a number of experiments were carried out. Is the intercepting trap really necessary ? Does it, in fact, intercept what it is supposed to do, viz., the sewer air, so as to prevent its entrance into house drains and so into houses, with consequent illness and injury to the health of the occupants ? Do the practical difficulties connected with the intercepting trap, and admitted by all from an engineering standpoint, outweigh all advantages claimed from the health standpoint ? The alleged practical difficulties of the trap are : (1) Interference with the ventilation of sewers, and the concomitant alleged iniquity of using private property for the carrying out of a public obligation ; (2) Necessity for the separate ventilation of the house drain, with the provision of a fresh-air inlet—so-called, as it often acts as an outlet, and thereby causes a nuisance ; (3) Interference with the free passage of sewage from the house drain to the sewer ; (4) Danger from the displacement of the stoppers of " raking arms."

As to the first question, evidence shows that practically there is no interference, and further that, if such interference exists, it is not serious, as the necessity for ventilation of sewers has been exaggerated ; e.g. the unventilated sewers of Bristol. The second is a serious difficulty, as the provision of the inlet causes a nuisance sooner or later, and, further, increases the expenses of construction. The third is also a serious difficulty, as the chief cause of stoppage is the intercepting trap, the sewage collecting in all cases in the trap, or the trap itself being actually blocked in about 25 per cent. The evidence shows that the provision of an inlet (fresh air) is unnecessary, and that all that is necessary is the provision of an outlet (generally the soil pipe), and that such outlet, in the absence of a trap, acts as part ventilator of the public sewer, and that, too, without a nuisance. In the report dealing with the fourth point, about 60 per cent of the stoppers were found to have been removed, or to have become displaced, actually causing a blockage to the trap in many cases, and in all cases allowing of the passage of sewer air into the house drains.

The alleged advantages of the trap are that it acts as a barrier to rats and to sewer air. The evidence produced in the Report shows that the trap is *not* a barrier to rats, but is, under practical conditions, a barrier to sewer air. The question arises, however, as to what difference (if any) exists between drain air and sewer air, as, even with a trap, the former must gain entrance into the house through any channels (defects or otherwise) through which sewer air might be likely to gain access. Wherein do the two differ—drain air and sewer air ? Both drains and sewers contain sewage ; but is the sewage decomposed, or more decomposed, in sewers than in drains, and consequently a greater danger to health ? Further, do microbes in the sewage in sewers get into the drains, and cause thereby dissemination of such diseases as they may cause from house to house ?

The chemistry and bacteriology of sewer and drain air naturally come in for careful investigation by the Committee, and the results recorded register once and for all the facts ; and as the investigators were Drs. Haldane, Horrocks, Andrews, Huntley, Renney, and Délépine, the facts cannot be disputed. In sewers, whether old or new, ventilated or unventilated, in which sewage is moving and not lying stagnant, the air differs but little from that of the atmosphere outside. The same may be stated of drains and drain air. There is, however, in sewer air, increased humidity, and a slight increase of CO_2, NH_3, and organic matter. Sulphuretted hydrogen is also occasionally present, under certain exceptional conditions, in the sewer air. The smell of sewer air is due to minute traces of a variety of volatile substances, e.g. indol, skatol, the mercaptans, and compound ammonias, decomposing moulds and fungi (on the walls of sewers), etc.

As to bacteriology, the Report states that notwithstanding the immense number of microbes in sewage, the number to be found in sewer air is extremely small, and that too, whatever the states of the sewers (good or bad, ventilated or unventilated, with or without deposits, etc.). The bacteriological investigations give results which tally with those of investigators in other countries, viz. Miguel (Paris), Uffelmann (Russia), Petri (Berlin), and Winslow (America). Further, the bulk of the bacteria of sewer air are derived from the atmosphere, and not from the sewage, and the bacteria of sewage origin (those that may be pathogenic) are rarely present in sewer air, and, when present, are present only in very small numbers—their presence being the result of " splashings."

The bacteriology of drain air is different from that of sewer air in one particular, viz., the extra " splashings " cause larger numbers of sewage microbes to be found in drain air than in sewer air, but even these rapidly subside. The corollary to be drawn from this fact is that, bacteriologically, there may be danger from drain air escaping from the outlets and inlets (that act as outlets at times) of ventilating shafts of house drains.

The conclusions arrived at by the Departmental Committee are : The disadvantages involved by the use of the intercepting trap are substantial and of serious pactical importance, but can be to some extent obviated, e.g. (*a*) By omitting altogether the fresh-air inlet, the soil pipe outlet being the only " ventilation " necessary, apart from anti-syphonage pipes ; (*b*) By reducing the size of the trap and making it, thereby, more self-cleansing, such as is found to be the case with a 6-inch drain on a 4-inch trap, a 9-inch drain on a 6-inch trap, and a 4-inch drain on a 3-inch trap ; (*c*) By constructing the house drains of iron, and by closing with a removable cover the usual open channels in the inspection chamber, which is generally provided as means of access to the trap.

The intercepting trap is an effectual barrier to the entry of sewer-air into the house drain, and is not liable to be forced and rendered useless by pressure of air from the sewer, the water seal never being destroyed —a statement which applies with equal force to the ordinary traps connected with a ventilated drainage system which is not trapped from the sewer.

On bacteriological or epidemiological grounds, the necessity of the intercepting trap has not been established in all cases, but under certain

conditions may be, so that it should be left to local Sanitary Authorities and their advisers to decide the question as to whether or not an intercepting trap is necessary or desirable in the light of local conditions, with due provision, in every case where the trap is used, against the effects of blocking of the trap itself.

The interference of the intercepting trap with sewer ventilation is non-existent, or has been exaggerated—free ventilation of sewers being, apparently, unnecessary, and open ventilating grids on the roadway being undesirable, if not an actual danger to health.

The Report emphasises the value of iron drains (with lead joints) in place of earthenware pipe (with cement joints)—a watertight earthenware drain being, practically, impossible in ordinary use. The cost of iron drains is greater, but only by about 20 per cent ; but, on the other hand, their construction is easier.

Milk and Dairies Bill.

The long-promised Milk and Dairies Bill was introduced into the House of Commons during 1912. The main objects of the Bill are : (1) More effective registration of dairies and dairymen ; (2) Inspection of dairies and the examination of the goods therein ; (3) Prohibition of the supply of milk from a dairy where such a supply has caused, or would be likely to cause, infectious diseases, including tuberculosis ; (4) Prevention of the sale of tuberculous milk ; (5) Regulation of the importation of milk, so as to prevent danger to the public health arising therefrom ; (6) The issue of regulations by the Local Government Board for securing the supply of pure and wholesome milk ; and (7) The establishment by local authorities in populous places of milk depôts, for the sale of milk specially prepared for infants.

The provisions as to registration of dairies supersede those contained in the Contagious Diseases (Animals) Acts and the Orders (commonly known as the Dairies, Milkshops, and Cowsheds Orders) made thereunder. The provisions as to the inspection of dairies and the prohibition of the supply of milk are based upon the provisions of the Public Health (Scotland) Act, 1897. The clause as to the prohibition of the sale of tuberculous milk is taken from the model milk clauses which have been incorporated in many Local Acts, but the scope of the enactment is somewhat extended. The Board of Agriculture and Fisheries intend to issue an Order under the Diseases of Animals Act, 1894, dealing with tuberculous cows, and providing for the payment of compensation in cases of slaughter by the local authority, and the Treasury are prepared, subject to the assent of Parliament, to sanction the payment from the Exchequer of one half of the net amount paid by way of compensation for a period of five years.

Doubtless many of its provisions will be of value to Sanitary Authorities.

Pemphigus Neonatorum.

A report by Drs. Wanklyn and Macrory was published during 1912 dealing with sixteen infants (newly-born), who were found to be suffering from a skin disease characterized by superficial blebs and subsequent excoriation ; four died. The cases occurred in the practice of one midwife, and represent about 50 per cent of her cases attended

during the period under investigation (one month). The lesions of the skin appeared at first like superficial burns, rapidly forming vesicles, which were apt to spread, developing in turn into bullæ, and involving extensive areas of skin. The original lesions did not appear to spread in cases where the vesicular fluid was carefully drawn off, without its touching other parts of the skin, and the blisters were protected and covered with a simple antiseptic powder and cotton-wool. The converse was found to hold good, so that presumably the vesicular fluid was contagious. The severity of the disease varied with the extent of the skin affected.

No definite cause for the outbreak could be assigned, nor could any satisfactory history be obtained as to the existence of similar cases amongst babies born at or about the same time in the immediate locality.

The midwife appeared to be in causal relation with the cases, but in what way the report does not suggest. Her appliances and methods were carefully examined, but nothing unsatisfactory was found ; nor could anything be found wrong with the soaps, powders, etc., used in connection with the washing of the babies, thereby excluding the theory of a mechanical irritant. The cases appeared to depend one upon the other, in that the midwife in attendance had been in contact with a previous case of the disease, or with a case of impetigo contagiosa, or other septic condition of skin.

Pemphigus neonatorum is a common disease amongst newly-born infants, and may result from inoculation (autoinoculation or from others) of the tender skin with the virus of impetigo, or other streptococcic infection, suggesting that the name " impetigo infantum " would be more appropriate etiologically. If this suggestion is the real explanation, the obvious preventive is to avoid contact of newly-born infants with children and others who have sores (nose, ear, or skin).

" Sanatorium Benefit " and Tuberculosis Dispensaries.

The burning question of " sanatorium benefit " under the National Insurance Act, 1911, was discussed and rediscussed again and again during 1912. The Local Government Board has been in a difficult position between two fires, viz., that of the British Medical Association fighting for the general medical practitioners, and that of the Sanitary Authorities fighting for their officers. Mistakes have been made on both sides, or, at least, a sufficiently broad view of the matter has not been taken.

The results of the discussions and decisions up to date may be summed up in the action of the Local Government Board as follows :

Suitably qualified and experienced men should be selected for the medical appointments at dispensaries and other institutions for the treatment of tuberculosis.

The general supervision and control of schemes for the provision of sanatoria and dispensaries should be in the hands of the medical officers of health, both on administrative grounds and also in order to secure the co-ordination of therapeutic and preventive measures.

The tuberculosis officers of dispensaries and the medical superintendents of the sanatoria or hospitals should, in clinical matters, be allowed independence of action, but medical officers of health should be the chief executive or organizing officers (tuberculosis).

Tuberculosis officers should be whole-time officers with adequate salaries, viz., £500 for chiefs and £300 for assistants, per annum, and their duties should consist of diagnosis, consultation, bacteriology, statistics, and also treatment (at dispensaries).

The appointment of local medical practitioners to serve on a dispensary staff, on a rota or otherwise, would be impracticable from an efficient administrative standpoint.

Tuberculosis officers should act as medical advisers to Insurance Committees for purposes of " sanatorium benefit."

Observation beds should be available for use in connection with a dispensary, though the beds need not be in the dispensary itself.

Ordinary domiciliary treatment should be carried out by medical practitioners, with the services of the medical dispensary staff in emergencies and in consultation.

Shelters and other articles that could be suitably used by patients at their homes should be lent out to the patients from dispensaries.

Medical superintendents of isolation hospitals should be allowed to treat tuberculosis patients, if sent into such hospitals.

The clinical examination of " contacts " for tuberculosis should be left to medical practitioners, as far as is compatible with Articles viii. and ix. of the Local Government Board's Order (Tuberculosis) of Nov. 15th, 1911, and the Board's circular letter of Dec. 6th, 1912.

On the matter of finance, definite promises are made, viz., grants by Local Government Board towards establishment charges (up to four-fifths) and half of maintenance expenses by the Treasury—the National Insurance Commissioners being answerable for the " insured " persons under the National Insurance Act, 1911, and their dependents (direct or indirect), and the Treasury for the remainder. With such promises, sanitary authorities should take heart and do their best. It is true that the burden falls upon the rates—but not upon the local rates to the extent that was anticipated, so that poor districts need not be overburdened.

The machinery required will be the same in all cases—the dispensary unit and the sanatorium or hospital unit, both to be linked up with the general preventive and public health work of sanitary authorities, and working in harmony with the general medical practitioners. The sanatorium or hospital unit will include a variety of different institutions, viz., the sanatorium proper for open-air treatment, the hospital for acute or chronic cases (surgical and medical), the convalescent home, the after-care colony, the open-air school, and last (but unfortunately not least) the home for the far-advanced cases that no treatment can save. Domiciliary treatment, and finally general sanitary measures, and the education of the people, must not be forgotten. It has been found difficult to satisfy both the British Medical Association and the Local Government Board on all the different points—more especially as regards treatment at dispensaries and the employment by rota of medical practitioners in connection therewith. It is clear, however, that, with this exception, a modus vivendi has been found, and the medical practitioners will form an important part of the schemes as regards domiciliary treatment. Without the sympathy and help of the medical practitioner, the best result will not be obtained in the battle against tuberculosis.

It must be remembered that the warfare is against tuberculosis in

the widest acceptation of the term, not only the pulmonary form, though the damage done to life and health by this one form of the disease is enormous. The mortality-rate in England and Wales at all ages is equal to 1521 males and 1141 females per million living, and the morbidity-rate is equal to three or four times that amount at least. Financially, too, the loss to the nation is enormous, viz., ten to fifteen millions of pounds sterling per annum. The task before the Insurance Commissioners is, therefore, a gigantic one, and every form of help will be necessary to secure successful results from the " sanatorium benefit " of the National Insurance Act, 1911. Fifty years should see the disease stamped out.

Sea-water Treatment.

The appearance in March, 1912, of " The Statistical Report of the Ambulatory Patients of the Quinton Polyclinic for Treatment by Isotonized Sea Water (for six months, July 1st to Dec. 31st, 1911)," has again drawn attention to this special treatment in diarrhœa infantum (enteritis and gastro-enteritis), gastritis, mucous colitis, and other diseases of the alimentary tract; eczema, psoriasis, and other skin diseases; diseases of the nervous system, anæmia, diseases of women, etc.

The statistics for enteritis and gastro-enteritis are of greatest interest, as those diseases, being of an epidemic nature, cause a large mortality and a wide morbidity, especially amongst infants and young children; 318 cases are dealt with, and the results of the treatment by injections of isotonized sea water (varying from 30 to 300 c.c each injection) are reported as satisfactory in the majority of cases; 12 deaths are tabulated. The nature of the diseases in the different cases varied in type from slight or mild to grave and even moribund, and, in addition, the great majority were ambulatory, long distances having to be travelled to and from the clinic. This latter fact must be borne in mind when comparing the results with those obtained from other treatment in hospitals, with proper nursing and good food, not to speak of hygienic surroundings, etc. In each individual case, the age and sex of the patient is set out, the general condition on admission, the nature of the treatment given, together with (*a*) immediate, and (*b*) after results.

The Quinton Polyclinic was established at 57, Poland Street, Soho, W., at the instance of M. Quinton, of Paris, the author of a work called " L'eau de Mer," dealing with isotonized sea-water as a therapeutic measure, the saline constituents of sea water made isotonic being comparable with the inorganic elements of the blood and tissue fluids of the vertebrates, the saline concentration of the primordial life-bearing seas being determined at 0·8 per cent,, which is a persistently constant degree in the circulating fluid through the chain of animal life from the simplest primordial marine forms up to the vertebrates of the present day. M. Quinton holds that the isotonized sea water has a potent, far-reaching, and highly beneficial influence on the human body in many forms of disease, containing, as it does, minute quantities of such elements as silicon, fluorine, iron, gold, iodine, lithium, phosphorus, etc., in solution, in a natural preparation and in a form that has not hitherto been imitated artificially. It is maintained that the solution must not be regarded as simply isotonic, or isosmotic, solution

of chloride of sodium (Ringer's fluid), which contains sodium chloride only. The sea-water is purified for injection by passage through a Pasteur-Chamberland filter, and prior to injection may be warmed to the body temperature.

Even allowing for the unintentional prejudice of the drafters of the Report, the facts set out are interesting, though it is a moot point as to whether or not equally good results could not have been obtained by the injection of normal saline solutions or even of plain water with or without 5 per cent glucose, the value of which is admitted in diseases which cause a draining of the water from the tissues of the body, e.g., severe diarrhœa, cholera, post-partum or other hæmorrhages, etc.

The Public Health (Milk and Cream) Regulations, 1912.

These are designed to secure that no preservative shall be added to milk, or to cream containing less than 35 per cent by weight of milk fat, at any stage from the place of production to that of delivery to the purchaser. In the case of cream containing over 35 per cent of milk fat, the addition of boric acid, borax, or a mixture of these preservative substances, or of hydrogen peroxide, is not prohibited by the Regulations, but is subject to a system of declaration which is required to be followed by all persons dealing with such cream for the purpose of sale and for human consumption. Further, the addition of any thickening substances to cream, or preserved cream, is prohibited—such thickening substances being enumerated as sucrate of lime, gelatin, starch paste, or any other substance except cane or beet sugar which, when added to cream, is capable of increasing its thickness.

The term " milk " includes separated, skimmed, condensed or dried milk, and the term " cream " means that portion of milk rich in milk fat which has risen to the surface of milk on standing and has then been removed, or which has been separated from milk by centrifugal force.

The Regulations consist of:—

(*a*) Four parts—Part 1, dealing with interpretation; Part 2, with prohibition of preservatives in milk and restriction in the use of preservatives in cream; Part 3, with restrictions on importation of foreign milk or cream (not in accordance with the Regulations); and Part 4, with determination of differences by the Local Government Board; and

(*b*) One schedule dealing with regulations with respect to the labelling of preserved cream—the declaratory label.

The duty of administering Parts 1, 2, and 4 of the Regulations is placed upon those authorities who are local authorities under the Sale of Food and Drugs Acts, and of Part 3 of the Regulations upon the Officers of Customs and Excise. The Regulations were made under the Public Health (Regulations as to Food) Act 1907, and apply to England and Wales, and came into force on Oct. 1st, 1912, as regards the main provisions, and on January 1st, 1913, as regards selling preserved cream as such, i.e., declaring the preservatives therein. The definition given of " preservative substances " is wide, meaning " any substance, preparation, or solution which, when added to milk or cream, is capable of retarding the onset of sourness or decomposition, or is capable of neutralizing acidity (sourness) in milk or cream."

It must be noted that, before proceedings are taken under Part 2 of the Regulations an opportunity shall be afforded to the vendor of furnishing an explanation, and the local authority shall consider such explanation and all the circumstances of the case. The proceedings are those authorized by the Public Health (Regulations as to Food) Act, 1907, and the enactments referred to in the article at the foot of the Order.

The Sale of Milk Regulations, 1912.

These Regulations amend those of 1901 in so far as they relate to skimmed or separated milk, and replace the limit of 9 per cent of total milk solids, on which under Article 3 of the 1901 Regulations a presumption that the milk is not genuine is based, by a limit of 8·7 per cent of milk solids other than milk fat.

The amendment is rendered necessary for the purpose of facilitating the prevention of the adulteration of skimmed milk with water. To take a concrete example: A sample of milk may show, on analysis, 1·5 per cent of fat and 7·5 per cent of milk solids other than milk fat, making a total of 9 per cent for the total solids. Under the 1901 Regulations no action could be taken having regard to these total solids not falling below 9 per cent, though the sample was a sample of imperfectly skimmed milk being adulterated with over 12 per cent of added water! Under the 1912 Regulations action could be taken, the milk solids other than milk fat having fallen below the limit of 8·7 per cent. On the other hand, hardship may result in a few cases of imperfectly skimmed milk. Thus, taking a sample of ordinary milk giving, on analysis, 3·0 per cent of fat and 8·5 per cent of solids other than milk fat, and extracting half the amount of milk fat so as to reduce it to 1·5 per cent, the solids other than milk-fat will be found to have increased to 8·63 per cent, and, consequently, the presumption under the 1912 Regulations would be in favour of added water. Where the deficiency of milk solids other than milk fat is slight, and the skimmed milk contains a considerable proportion of milk fat, no action should be taken without careful consideration.

The Regulations, dated June 29th, 1912, were made by the Board of Agriculture and Fisheries, in exercise of the powers conferred on them by Section 4 of the Sale of Food and Drugs Act, 1899, and came into operation on Sept. 1st, 1912, throughout England and Wales. Article 3 of the 1901 Regulations is revoked, and in its place the following Regulation is inserted:—

Skimmed or Separated Milk.— "Where a sample of skimmed or separated milk (not being condensed milk) contains less than 8·7 per cent of milk solids other than milk fat, it shall be presumed for the purposes of the Sale of Food and Drugs Acts, 1875 to 1907, until the contrary is proved, that the milk is not genuine, by reason of either the addition thereto of water, or the abstraction therefrom of milk solids other than milk fat."

Tuberculosis in School Children.

Statistics are accumulating, showing the incidence of tuberculosis upon school children. The results may be broadly stated as 0·6 per cent for all forms of tuberculosis, and 0·2 per cent for tuberculosis

pulmonum. These results are based on medical inspection, more or less exact, and take no account, therefore, of the school children who are, for one reason or another, not in attendance at school and, consequently, not subjected to inspection, but who, nevertheless, may be, and probably are, tuberculous-infected, as shown by the fact that 20 to 30 per cent of children who die at school age are certified as dead from tuberculosis, the certifications being based on post-mortem revelations.

All these results may be summed up as being relative to the victims of the tubercle bacilli; but account must be taken also of the large numbers of children tubercle-infected, but in whom the tubercle bacilli fail to "catch on," being rendered harmless, temporarily or permanently, by the "antibodies" which exist in all human beings. These natural cures or arrestations, nevertheless, give a positive reaction with tuberculin, and hence it is that percentages of as much as 40 to 50 are tabulated as averages for school children subjected to and giving the tuberculin diagnostic reaction.

LEGAL DECISIONS.

The following legal decisions, given during 1912, are important in their relation to State Medicine and Sanitary Administration :—

1. Adulteration of Food and Drugs.

(*a*). *Dairy Supply Co. Limited* v. *Houghton* (*King's Bench Division*).

Sale of Food and Drugs Act, 1899, s. 20 (6)—*Judicature* (*Procedure*) *Act*, 1894, s. 2 (1), (2)—*False warranty—Milk—Proper inference from facts.*

A sample of milk was certified by the Public Analyst as deficient in fat (9 per cent), and the vendor claimed a warranty and summoned the wholesale dealers for giving a false warranty contrary to s. 20 (6) of the 1899 Act. The Justices convicted, and the conviction was upheld by Quarter Sessions, although it was pointed out that the wholesale dealers had taken every precaution to ensure the milk being sold in the same condition as supplied to them, and, when they gave the warranty, they had reason to believe that the warranty was true. On appeal to the High Court it was *held*, that under s. 2 of the Judicature (Procedure) Act, 1894, the High Court had power to draw the proper inference from the facts stated in the case, and that the Justices ought to have come to the conclusion on the facts that the appellants had reason to believe that the warranty was true, and that the conviction must be quashed. *Appeal allowed.*

(*b*). *Monro* v. *Central Creamery Company Limited* (*King's Bench Division*).

Sale of Food and Drugs Acts, 1875 (ss. 13, 14, 20), 1899 (s. 19)—*Margarine Act*, 1887, s. 12—*Butter and Margarine Act*, 1907, ss. 2 (1), 3, 11—*Butter taken by officers of the Board of Agriculture and Fisheries not subject to conditions imposed by sections of the Sale of Food and Drugs Acts.*

The Magistrate convicted, but on appeal it was *held*, that the formalities prescribed by s. 14 of the Sale of Food and Drugs Act, 1875, and the conditions imposed by s. 19 of the Sale of Food and Drugs Act, 1899, do not apply to a prosecution under s. 3 of the Butter and Margarine Act, 1907, by an officer of the Board of Agriculture and Fisheries, who takes samples for analysis under s. 2 (1) of the Butter and Margarine Act, 1907. *Appeal allowed.*

(*c*). *Millard* v. *Allwood* (*King's Bench Division*).

Margarine Act, 1887, s. 6—*Sale of Food and Drugs Act*, 1899, s. 6—*Butter and Margarine Act*, 1907, s. 8—*Margarine—Printed matter on cover or wrapper other than word "margarine."*

A packet of margarine was sold in wrappers on which words were printed other than and in addition to the word "margarine" (in letter

of a certain size). The vendor was convicted by the Magistrate, and the conviction was upheld on appeal; it being *held*, that no printed matter other than the word " margarine " was to appear on the wrapper.

Appeal dismissed.

(*d*). *Retail Dairy Co. Limited* v. *Clarke* (*King's Bench Division*).

Sale of Food and Drugs Act, 1899, s. 20 (1)—*Warranty Time within which notice must be given.*

Milk containing 9 per cent of added water was sold to an Inspector, and proceedings were instituted. Notice of warranty was given, but was not received until after the seven days allowed in s. 20 (1) of the Food and Drugs Act, 1899, though posted within that time. The Magistrates held that under the circumstances the warranty could not be relied upon, and convicted the vendor, who appealed, when it was *held*, that it is a sufficient compliance with the provisions of s. 20 (1) of the Food and Drugs Act, 1899, if the documents are posted within the seven days; and that it is not necessary that they should be received, or posted so as to be received, by the addressees within that period. *Appeal allowed and conviction quashed.*

(*e*). *Davies* v *Burrell* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 14—*Notification to seller or his agent—Sale by one agent but notification to another.*

Held, that it is a sufficient compliance with s. 14 of the Sale of Food and Drugs Act, 1875, as amended by s. 13 of the Sale of Food and Drugs Act, 1899, if the notification and the delivery are made to an agent of the seller, and that such agent need not necessarily be the agent who sold the article. *Appeal dismissed.*

(*f*). *Williams* v. *Friend* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Cream with boron preservative —Notice to purchaser exhibited in the shop.*

A sample of cream contained boron preservative (33·8 grs. of boric acid per lb.), but before the cream was purchased the Inspector saw a notice exhibited in the shop to the effect that all cream sold contained a small proportion of boron preservative (not exceeding 35 grs. of boric acid per pound, i.e. half of 1 per cent). The Magistrate convicted; but on appeal it was *held*, that the purchaser had notice that the article was mixed with something else. Therefore that there was no evidence that there was a sale to the prejudice of such purchaser.

Appeal allowed and conviction quashed.

(*g*). *Preston* v. *Redfern* (*King's Bench Division*).

Sale of Food and Drugs Act, 1875, s. 6—*Milk not of the nature, substance, and quality demanded—Vessel not stirred.*

A sample of milk was shown to contain 12 per cent of added water; but it came out in evidence that the vessel in which the milk was kept had not been stirred, so that the sample did not fairly represent the whole contents of the vessel. The Justices refused to convict and, on appeal, the Appeal Court upheld the Justices' decision.

Appeal dismissed.

2. Criminal Abortion.

Rex v. *Lumley* (*Central Criminal Court*).

Criminal Law—Abortion—Death of patient—Manslaughter or murder.

An important direction to the jury was given by a Judge in the case of Rex v. Lumley. Abortion was procured, and the patient died. The Judge directed that if, when the operation was performed, the operator must have contemplated as a reasonable man that death or grievous bodily harm was likely to result, he is guilty of murder; but if, when the operation was performed, the operator had not at the time contemplated, and could not as a reasonable man have contemplated, that either death or grievous bodily harm would result, he is guilty of manslaughter. *Verdict—7 years' penal servitude for manslaughter.*

3. Drains and Sewers.

(*a*). *Meyrick* v. *Pembroke Corporation* (*King's Bench Division*).

Public Health Act, 1875, ss. 23, 36—*Distance of site of house from sewer.*

The Pembroke Corporation served notices under ss. 23 and 36 of the Public Health Act, 1875, requiring the provision of a w.c. instead of an existing privy, and the making of a covered drain emptying into a sewer not more than 100 feet from the site of the house. The sewer was 98 ft. 4 ins. from a detached out-building in the yard of the house, but was 119 ft. 4 ins. from the main wall of the house. The Corporation eventually carried out the work, and the owner appealed, when it was *held*, that as the outbuildings were less than 100 feet from the sewer, the respondents were entitled to recover the cost of the work—the out-building and also the privy to be treated as part of the house.

Appeal dismissed.

(*b*). *Lincke* v. *Christchurch Corporation* (*Court of Appeal*).

Public Health Act, 1875, s. 308—*Damage from carrying out necessary works to sewerage system—Partial stoppage of access to shop—No negligence.*

The Division Court held that, as there was no negligence or unreasonableness on the part of the Authority, there was no damage by partial stoppage of access to shop. On appeal, it was *held*, that the plaintiff was entitled to compensation under s. 308 of the Public Health Act, 1875, because the act done by the defendants was an act which if done by a private individual would have given good cause of action.

Appeal allowed.

4. Drainage Bylaws.

Marylebone Borough Council v. *White* (*King's Bench Division*).

Metropolis Local Management Act, 1855, s. 202—*Drainage bylaws—Soil-pipes—Interpretation of bylaws.*

Soil-pipes were constructed partly inside and partly outside a building, and were constructed in iron throughout, although the bylaw

requires drawn lead to be used inside premises. The local Authority took out a summons for infringement of bylaws, but the summons was dismissed. On appeal, it was *held*, that the bylaw was applicable to a case where the soil-pipe was constructed partly inside and partly outside the building, and did not deal merely with soil-pipes which were entirely outside or entirely inside a building.

Appeal allowed and case remitted.

5. Factories and Workshops.

(*a*). *Royal Masonic Institute* v. *Parkes* (*King's Bench Division*).

Factory and Workshop Act, 1907, s. 1—*Factory and Workshop Act*, 1901, s. 128—*Factory—Affixing abstract—Laundry of a Public Institution.*

At the Royal Masonic Institute for Boys, one of the buildings was set apart for use as a laundry for washing the linen of the inmates only. The Justices *held*, that the institution was a public institution, as in the case of Seal *v.* British Orphan Asylum (*vide* Medical Annual) 1912, p. 606). The Court of Appeal upheld the conviction, declaring the institution to be a "public institution" within the meaning of s. 1 of the Factory and Workshop Act, 1907, and that, therefore, an abstract was to be affixed in accordance with s. 128 of the Factory and Workshop Act, 1901. *Appeal dismissed.*

(*b*). *Johnson* v. *Lalonde Brothers & Parham* (*King's Bench Division*),

Factory and Workshop Act, 1901, ss. 1 (3), 149 (1), *6th schedule—Definition of factory—Carpet-beating as a manufacturing process.*

Held, that premises in which carpets were beaten by means of a machine driven by a gas engine within the premises were a "factory" within the definition laid down in s. 149 (1) of the Factory and Workshop Act, 1901, and schedule 6.

Appeal allowed and case remitted.

6. Insurance Act.

National Insurance Commissioners v. *Hurlock* (*Police Court*).

National Insurance Act, 1911—*Non-payment of contributions by an employer is an offence, irrespective of whether or not arrangements had been made for administering the benefits under the Act.*

The question was raised as to the liability of contributors arising before proper arrangements had been completed for the efficient administration of the Act, e.g. fixing the time for payment of contributions, the making of provision for sanatorium or medical benefits, the issuing of regulations governing medical benefit or sanatorium benefit, etc.

Held, that the payment of contributions under the Act must be made irrespective of whether or not the Government or the Insurance Commissioners had or had not made arrangements for administering the

benefits under the Act, and that, consequently, an order would be made for the payment of the contributions, with penalties for neglect and costs.

An appeal was taken to the High Court, when it was *held*, that the Magistrates' decision was correct. *Appeal dismissed.*

7. Medical Expert Evidence.

Rex v. *Mason* (*Court of Criminal Appeal*).

Criminal Law—Murder case—Expert evidence of witness who had not seen the body—Admissibility.

In a trial for murder (stabbing case), the Crown's expert witness had not seen the body, but from the description given by the other medical witness, gave it as his opinion that the wound was not self-inflicted. This evidence was objected to, but the Court of Appeal *held*, that in a trial for murder the evidence of an expert witness (medical) as to whether in his opinion a wound was self-inflicted is admissible if the state in which the body and wound were found was described to him, as being his opinion on assumed facts, although he has not himself seen the body and the wound. *Appeal dismissed.*

8. Medical Treatment of School Children.

Allan v. *Glasgow School Board* (*Court of Session*).

Education (*Scotland*) *Act*, 1908, *s.* 4—*the words "medical inspection and supervision" do not include the necessary treatment.*

Miss Allan, as a ratepayer, raised an important point as to the powers of School Boards to carry out the subsequent (and necessary) treatment of school children who are found, on inspection and supervision, to be defective, and the Court of Session has settled the point with no uncertain voice. The Court *held*, that a School Board in Scotland is not entitled to provide and pay out of the School Board rate for medical or dental treatment either (*a*) by providing school doctors and apparatus, or (*b*) by sending the defective children to medical practitioners or to hospitals (or other institutions) for treatment. The decision applied also to cases in which the parents were unable to provide the necessary treatment by reason of poverty. The decision is vital from an administrative standpoint, at least so far as Scotland is concerned, and will necessitate a special vote of money for the purpose of treatment of school children from the Exchequer to the Scottish Education Department.

N.B.—The wording of s. 4 of the Education (Scotland) Act, 1908, deals with "medical inspection and supervision," and differs, therefore, from the wording of the Education (Administrative Provisions) Act, 1907, s. 13, which applies to England, as follows: "Medical inspection of school children and such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools." In addition, in so far as England is concerned, a supplementary Act has been passed to clear up any ambiguity of interpretation, viz., the Local Education Authorities (Medical Treatment) Act, 1909.

9. Nuisances.

(1). *Offensive Trades.*

Attorney-General and the Plymouth Corporation v. *Plymouth Fish, Guano, and Oil Company Limited* (*Chancery Division*).

Public Health Act, 1875—*Smells from Guano Works—Nuisance—Injunction.*

The works were situated outside the Plymouth Borough, the inhabitants of which were affected seriously by the nuisance from the noxious and offensive fumes given off from the manufacturing processes connected with fish, guano, and fish oil. An injunction was applied for, and the defendants claimed that the best practicable means had been taken to prevent the nuisance.

Held, that an injunction could be granted to restrain the defendants from carrying on a factory so as to be a nuisance, even though every endeavour had been made to abate the nuisance. *Injunction granted.*

(2). *Smoke.*

(*a*). *Greenwich Borough Council* v. *London County Council* (*King's Bench Division*).

Public Health Act, 1891, *s.* 4—*Nuisance from black smoke—Notice to abate—Recurrence or fresh nuisance.*

A summons was taken out against the London County Council for non-compliance with a notice of the Greenwich Borough Council to abate a nuisance from black smoke and to prevent its recurrence. Between five and six months afterwards the nuisance recurred, and the proceedings were reopened before the Court, but the Magistrate held that it was a new (fresh) nuisance requiring new proceedings as required by the Act. On appeal it was *held*, that the Magistrate's decision be affirmed—the second alleged nuisance being a separate and independent occurrence in view of the evidence submitted. *Appeal dismissed.*

(*b*). *Bessemer & Co. Limited* v. *Gould* (*King's Bench Division*).

Public Health Act, 1875, ss. 303, 334—*Bolton Improvement Act*, 1854, s. 116—*Bolton Order*, 1893, *article* 11. (2) (*a*)—*Nuisance from black smoke, and exception clauses.*

This decision is important, as it appears to show that, under certain circumstances, a private Act may override a Public Statute. A Bolton firm was convicted for a nuisance from black smoke in connection with their manufacturing under the Local Government Board's Provisional Orders Confirmation (No. 15) Act, 1893, made under the provisions of the Public Health Act, 1875, s. 303. An appeal was lodged on the ground that the Public Health Act, 1875, s. 334, made certain exceptions, including the rolling of metal, which was admitted to be the firm's manufacturing process. It was *held*, that the enactment contained in an article of the Bolton Order, 1893, is not subject to the provisions of s. 334 of the Public Health Act, 1875.

Appeal dismissed.

10. River Pollution.

Attorney-General and Eckford v. *Lewes Corporation* (*Chancery Division*).

Public Health Act, 1875, ss. 15, 19, 299—*Pollution of natural stream by sewers discharging into it—Culvert.*

A nuisance was created by the Lewes Corporation discharging sewage into what was formerly a brook, the bed of which became sewage-polluted in consequence, whilst a portion of the bed which was culverted was out of repair as regards the culvert, allowing sewage to escape. Fresh water flowed along the bed of the brook during the winter months, but the Lewes Corporation had discharged sewage into the stream for twenty years.

Held, that the culvert and open channel had become a sewer by the passage into it of the sewage, and that the defendants were liable to pay damages (£495), and must be restrained by injunction from causing a nuisance by discharge of sewage into (*a*) the open channel or bed or (*b*) the culvert, which, being defective, allowed such sewage to escape.

Judgment for the plaintiff.

11. Superannuation (Poor Law).

Lawson v. *Marlborough Union* (*Chancery Division*).

Poor Law Officers Superannuation Act, 1896, ss. 2–4, 12, 19—*Vaccination Act*, 1867, ss. 2, 3, 5, 6, 9, 10, 26—*Vaccination Act*, 1898, ss. 6, 10—*District Medical Officer and Public Vaccinator—Combined appointment—Superannuation.*

A district medical officer held the appointment of public vaccinator also, and claimed the fees paid to him as such to be "emoluments" within the meaning of the provisions of the Poor Law Officers Superannuation Act, 1896.

Held, that the fees paid to a public vaccinator are not paid to such officer as an officer or servant in the service or employment of the guardians, and therefore cannot be taken into consideration in calculating superannuation allowance as "emoluments."

Case settled by agreement.

12. Unsound Food.

(*a*). *Hewett* v. *Hattersley* (*King's Bench Division*).

Public Health (*London*) *Act*, 1891, s. 47—*Article unfit for food—Condemnation not necessary to prosecution.*

A large quantity of unsound fish was found in Billingsgate Market, deposited for sale for the food of man, and it was destroyed by the officers of the Fishmongers' Company. The fish was not seen by a justice nor condemned by him, but a summons was taken out under s. 47 of the Public Health (London) Act, 1891, and the charge was proved to the satisfaction of the Justice before whom the case was heard. On appeal, it was *held*, that condemnation by a justice of an article unfit for food is not a condition precedent to a prosecution under s. 47 (2) of the Public Health (London) Act, 1891.

Appeal dismissed.

(*b*). *Rex* v. *Ascanio Puck & Co. and Paice* (*King's Bench Division*).

Public Health (*London*) *Act*, 1891, s. 47—*Food unfit for human consumption, and voluntary surrender.*

Held, one who sells unsound food, liable to be seized, to another person, which is not in fact so seized, but is voluntarily surrendered by the purchaser, is not guilty of an offence under s. 47 (3) of the Public Health (London) Act, 1891.

Held, an indictment lies against a limited company in respect of an offence created by s. 47 (3) of the Public Health (London) Act, 1891.

Verdict for Defendants.

13. Water Supply.

(*a*). *Bristol Guardians* v. *Bristol Waterworks Company* (*Chancery Division*).

Waterworks Clauses Act, 1847, ss. 35, 53—*Bristol Waterworks Act*, 1862, ss. 4, 68, 73—*Water supply for domestic purposes—Workhouses, offices, and children's homes—Public institution and private dwelling-house.*

The Bristol Guardians had paid for many years for water supply by meter for offices, committee rooms, caretaker's residence, and three workhouses, and for four detached houses, three of which were used for the reception of pauper children and one was a laundry. The Guardians claimed that the buildings were private dwelling-houses, and as such entitled to be supplied with water at rates calculated on the annual value of the premises.

Held, that the words " private dwelling-houses " were not equivalent to " dwelling-houses," and that the buildings under review were not " private dwelling-houses," but only dwelling-houses in the sense that they were public institutions. *Action dismissed.*

N.B.—On appeal to the Court of Appeal, this decision was affirmed, and the appeal dismissed.

(*b*). *Colley's Patents Limited* v. *Metropolitan Water Board* (*House of Lords*).

Metropolitan Water Board (*Charges*) *Act*, 1907, ss. 8, 9, 16, 20, 25—*Domestic purposes—Supply of water for sanitary conveniences and washing accommodation.*

This was an appeal from the order of the Court of Appeal (*vide* Medical Annual, 1912, p. 608). The House of Lords affirmed the order of the Court of Appeal, viz., that the water supply was " for domestic purposes." *Appeal dismissed.*

III. INDUSTRIAL DISEASES AND TOXICOLOGY.

Industrial Diseases.

The address of Sir Thomas Oliver, delivered at the Congress of Hygiene at Washington, on September 23rd, 1912, brings up to date present knowledge of industrial diseases, or diseases of occupation, the outcome of civilization, and due to the rise of chemistry, the invention of machinery, the massing of the people, and the growth of modern towns.

Apart from mechanical injuries, two of the principal dangers of modern industrial life are *dust*, *fume*, and *smoke*, e.g. smoky air and pulmonary diseases, harmful effects of road and street dust on vegetable and animal life and upon man, etc. Dust is matter in a state of fine division, and the matter itself may be more or less harmful and injurious to health ; fume is the gaseous form of metals, non-metals, and their compounds, or the return of these from the gaseous to the solid state, as seen in the deposit in the flue of a lead-smelting factory ; and smoke is the outcome of the incomplete combustion of hydrocarbons, such as coal, wood, and oil. Soot is hydrocarbon which has not completely combined with oxygen to form gas. Dust and fume and smoke have played their parts in indirectly shaping the social habits of the people. Enterprise and manufacture have been stimulated to get rid of dust and fume in the factory, of smoke in the atmosphere, and of the incidence of all these upon the skin and the respiratory organs of man, leading to the employees becoming a well-washed people.

Coal dust and its dangers have undergone a change. There is no longer a high mortality from lung diseases, owing to improved methods of ventilation. This is indeed excessive, and, in its excess, causes the fine coal dust to rise and accumulate, and in its turn to ignite and explode on account of its mixture of carbon and oxygen, leading to a general explosion of air, dust, and volatile matter, with after-formation of carbon-monoxide, this last-named gas causing 80 per cent of the deaths in a mine explosion. Coal dust has the power of absorbing oxygen and other gases, and giving them off again into the atmosphere as the barometric pressure falls—the coal dust acting like a sponge, and absorbing gas to as much as several times the volume of the coal, especially in the dark with a high barometric pressure and an increased atmospheric temperature. How can the amounts of oxygen or gas be reduced in mines ? It has been proposed not only to reduce them but to add a small proportion of CO_2 to the atmosphere of mines, whilst a further proposition has been made to mix the coal dust with stone dust by strewing the mines with the latter.

The abolition of *phosphorus* necrosis (in the manufacture of lucifer matches made from the dangerous white phosphorus) is practically an accomplished fact throughout the civilized world, and has been brought about by the substitution of sesquisulphide of phosphorus for the white variety. A similarly satisfactory result has not been accomplished in connection with manufactures using *mercury*, e.g. furriers, mirror silverers, mercury smelters, etc. Dust and disease of the lungs, including tuberculosis, have an intimate inter-relationship, but it is only recently that scientific examinations of the dust have been made. Moist dust is more dangerous than dry dust, in that the watery envelope

may contain the germs of diseases or the products of fatigue. Some of the dust is breathed into the lungs, some retained in the nares, and the rest swallowed into the alimentary tract, where it is supplemented by the dust retained temporarily in the nares and afterwards swallowed with mucus. Pulmonary anthracosis is, in part, the result of dust particles being swallowed and carried to the lungs from within through the lymphatics; but the direct inhalation of the particles through the bronchi is the chief source of the trouble. All pneumokonioses begin as non-tuberculous diseases, the direct results of dust irritation, followed by bronchial and pulmonary catarrhs, with a liability to subsequent tubercle infections.

Uniformity in the statistics of industrial diseases is wanted, whilst compulsory and early notification of these diseases should be made applicable throughout all countries as it is at present in Great Britain. International clinics and international methods of collaboration would follow.

Poisoning from Uncommon Sources.

1.—*Abors' Arrows.*—An oleaginous resinous body obtained from an arrow head (removed from a wounded man) and soluble in alcohol, dilute acetic acid, ether, and chloroform. It gives the "croton-oil reaction" on the tongue, in the pharynx, and on the skin of the forearm. No symptoms of poisoning followed inoculation into guinea-pigs. A minute trace of alkaloidal body was obtained on extraction with alcohol, but no aconite. The poison of the Abors' arrows is a paste made by pounding the soft parts of the *Croton tiglium* plant (not the seeds).

2. *Arsenical Fumes from Coke Stove.*—Symptoms of vomiting and loss of power in the legs in girl workers at a laundry were traced to arsenic fumes from a coke stove, traces of arsenic being found in the urine. The other symptoms noticed were: Numbness, absence of knee-jerks and plantar reflexes, impaired sensation to touch, retention of urine, diplopia, etc.

3. *Carbon Bisulphide.*—The solution used was that used by shoemakers for dissolving rubber, and the symptoms detailed were: Unconsciousness, dilated pupils, cold almost pulseless body, diarrhœa and vomiting, with death. The effect of the carbon bisulphide is to disintegrate the red blood corpuscles, with the production of methæmoglobin.

4. *Dieffenbachia Seguina.*—Chewing the shoots and leaves gave rise to acute poisoning, with the following symptoms: Sore and swollen tongue and lips, enlarged submaxillary and parotid glands, slight reduction of Fehling's solution by the urine.

5. *Formaldehyde Gas Solution.*—Death resulted from swallowing about one ounce of commercial formalin (40 per cent solution of formaldehyde gas in water), and the symptoms were: Tendency to vertigo, unconsciousness, heavy breathing, vomiting, severe pains in alimentary canal, irritation of kidneys, and cerebral irritation.

6. *Methylic Alcohol.*—The symptoms may be tabulated as follow: Nausea and vomiting, followed by marked prostration and cyanosis of the face and extremities; deep and difficult breathing; tonic and clonic convulsions, accompanied by pain, colic, and headache; dilated pupils, with paralysis of accommodation, failure of reaction to light;

somnolence and amnesia, with exaggerated tendon reflexes, opisthotonos, and mental excitability, etc. Death ensued in many cases. The methylic alcohol must have been impure.

7. *Mirbane Oil* (*Nitrobenzol*).—It is a clear, bright yellow fluid, with aromatic odour of an almond-like character, and is used in the manufacture of blacking. It is obtained by the action of strong nitric acid on benzene. A workman applied some oil of mirbane on cotton-wool to his teeth for tooth-ache, with the result that the following symptoms ensued: Sudden drowsiness and unconsciousness, vomiting, blueness of lips, odour of an almond-like character exhaled from the body, cold extremities, pupils dilated, conjunctivæ insensitive, breathing slightly embarrassed, pulse hardly perceptible, etc. The blood is dark and fluid, giving the spectrum of acid hæmatin, and probably losing its oxygen-carrying power.

8. *Nitroglycerin.*—Nitroglycerin poisoning is met with during blasting with blasting powder of the nitroglycerin variety. The symptoms are: Headache, nausea and vomiting, jaundice, œdema, general toxic symptoms, and fatal syncope as the result of its action upon the vascular system. Apart from the nitroglycerin itself, the fumes, which are given off when warmed, and the gases evolved during combustion or blasting, also cause distinct symptoms due to such fumes and gases, e.g. nitrous fumes, CO, and CO_2. They gain entrance into the body through the alimentary, respiratory, or epidermal channels. Oxyhæmoglobin of the blood is converted into methæmoglobin by nitrites, with a locking up of the oxygen in the new compound.

9. *Picric Acid.*—Use (in error) as a dusting powder for a burn caused the following symptoms: Yellow discoloration of skin and sclera, with large brownish-yellow patches, vomiting and diarrhœa (yellow, slimy motions), brownish urine, rapid pulse, general erythema of the skin, stupor, collapse and death.

10. *Stramonium.*—Poisoning from an infusion of stramonium leaves given in mistake for senna caused the following symptoms: Restlessness, delirium, and unconsciousness, flushed face, quick pulse, shallow and rapid respirations, dilated pupils, etc.

11. *Veronal.*—The symptoms of veronal poisoning are: Vertigo, nausea and vomiting, stupor or mental confusion, muscular weakness, thirst, macular and erythematous or vesicular eruption on the skin, dilated or contracted pupils, diplopia, oliguria, etc.

THE EDITOR'S TABLE.

Samples and particulars for this section should be sent before November 15th. It is much to the interest of manufacturers to observe this rule.

In the Section for NEW MEDICAL INSTRUMENTS AND APPLIANCES, we give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves and subject only to certain simple conditions.

(1) Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a *separate* sheet or sheets of paper. This should have attached to it a copy of any illustration (*which must be small*) for which insertion is desired, and also bear the name of the firm. The paper should be of medium size.

The attention of Firms who send a large number of articles for notice is particularly directed to the above condition, as each article has to be sorted into its proper department before it can be considered.

The Editor is not able to accept reference to circulars, catalogues, or literature as a compliance with this condition.

(2) Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.

In respect to PHARMACEUTICAL PRODUCTS and DIETETIC ARTICLES, we are always ready, when a sufficient quantity is sent to us *early in the year,* to arrange for them to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the *Medical Annual* has come to be valued.

MEDICAL AND SURGICAL APPLIANCES.

Anæsthesia Finder.—This was suggested by Dr. David Forsyth as a help in the investigation of nervous diseases, and is for use in discovering and mapping out areas of cutaneous anæsthesia, etc. One end of the instrument, which is lightly made, is pointed but blunt, for testing common sensation and

provoking skin-reflexes. The other end, expanded and smooth, is used for hyperæsthesia, and is serrated to carry a pledget of wool for detecting the finer shades of paræsthesia. (*Fig.* 111). Messrs. Down Bros. Ltd., London.

Anæsthetics, Apparatus for.—(*See* INHALERS.)

Apparatus for Resuscitation of Moribund Children.—(Suggested by Mr. G. R. Potter.) Every practitioner frequently meets with cases in which children are still-born; of these a large number can undoubtedly be brought round by prompt treatment. The ordinary method of artificial respiration by working the arms is not so efficient as it might be, although it answers in many cases. Direct inflation of the lungs by breathing in and out of the child's mouth is much more efficient,

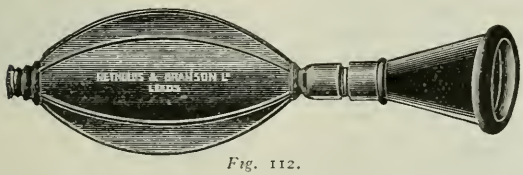


Fig. 112.

but very objectionable for the operator. To obviate this disadvantage, a mechanical inflator (*Fig.* 112) has been designed, consisting of a valved oval india-rubber ball fitted to a small mouthpiece with inflated rim; the parts are detachable, and take up little space when placed in a sterilizable impermiette bag. Price in impermiette bag, 12/6. Messrs. Reynolds & Branson Ltd., Leeds.

Artificial Limbs.—We have received from Mr. W. R. Grossmith, of 110, Strand, W.C., a catalogue of the latest inventions which have been made in the manufacture of artificial limbs. The great mechanical ingenuity exhibited in supplying the place of the absent muscles is extremely interesting. While certain definite principles are common to each appliance, the skill of the mechanist is exhibited in meeting the requirements of the particular case, and it is here that Mr. W. R. Grossmith has attained his great reputation.

We think that every surgeon should possess a copy of the catalogue, which can be obtained on application. We illustrate (*Fig.* 113) the artificial limb used after amputation through the hip joint. It is remarkable that in such cases the power of walking can now be restored.

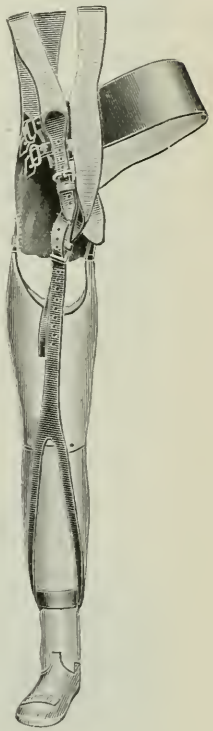


Fig. 113.

Aseptic Dressing Case.—A metal case, which for convenience is carried in a leather attaché case, and is divided up into compartments for all things likely to be required for aseptic dressing, has been manufactured by Messrs. Allen & Hanburys Ltd., 48, Wigmore Street, W., at the suggestion of Mr. W. W. Linington, F.R.C.S. It is very practicable and portable, and costs 65/–.

Asepsis of Instruments.—Our article of last year, in which we called attention to the very great advantage of keeping surgical instruments immersed in Brytstele solution instead of sterilizing them by boiling, has brought us many letters both from home and the colonies. It does not appear to be sufficiently understood that Brytstele, containing as it does at least 2½ per cent of cresol, is a very powerful antiseptic: it will kill typhoid and diphtheria bacilli in less than one minute. An instrument kept in this solution, and simply rinsed in hot tap-water before use, is more likely to be aseptic than one which, having been sterilized by boiling, has to be subsequently dried.

We have kept a large number of instruments in this solution during the past twelve months, including hypodermic syringes as well as surgical knives, forceps, etc., and they are all as bright and highly polished to-day as when they came from the makers. We think the retaining of polish on instruments is important to asepsis. The dull appearance presented by instruments after constant sterilization means a roughened surface which will hold germs.

In respect to surgical knives, they keep sharp, because their edges are not rusted by constant boiling and drying. Our experience is all in favour of the efforts made by the Medical Supply Association, 167-173, Gray's Inn Road, W.C., to induce the profession to try this method of preserving their instruments. The saving of time and trouble is enormous, and the results are wholly satisfactory.

Bandages (The "Domen").—For a porous elastic bandage (without rubber) we believe that there is nothing to equal the "Domen" bandages. One remarkable feature is that they lose nothing in width by being stretched. They also retain their elasticity after being washed. They are supplied in neat boxes in lengths of 5½ yards when stretched, at the following prices. Width 2¼ inches, 11d.; 2¾ inches, 1/1; 3¼ inches, 1/3. It will be seen that the prices compare favourably with other elastic bandages. The "Domen" Belts Co. Ltd., 456, Strand, W.C.

Bed Cradle (Patent Folding).—The storage and transit of the old model of bed cradles has always been inconvenient, as they take up so much room, and are so unwieldy. By this invention (*Fig.* 114) the cradle collapses

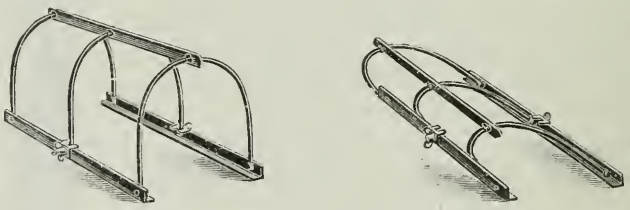


Fig. 114.

and becomes quite flat, when it goes into a very small compass. They are very practical, and being made entirely of metal, are very durable. They are sold in sets of three different sizes, price 21/– the set. We can highly recommend them for use in hospitals and nursing homes. Messrs. R. Sumner & Co. Ltd., 50*a*, Lord Street, Liverpool.

Bed Rests.—We noticed in a former issue the "Lansdown" bed rest, designed by Sister Frances, of the Lansdown Hospital, Bath. It is on the hammock principle, and we have found nothing to equal it for comfort in the more serious cases of debility. We are asked to state that it is now sold by the Hospitals & General Contracts Co. Ltd., Mortimer St., W., and costs 8/6.

Bed Rest (Foot).—This is an ingenious arrangement by which the tendency of the patient to slip down while in bed is prevented. It can be used either with or without the hot-water bottle as shown (*Fig.* 115). It allows some amount of exercise to the muscles of the leg, which would otherwise become cramped by inaction. We have not tested the appliance, but the idea appears good. It is made by Messrs. Philip Harris & Co. Ltd., of Birmingham.

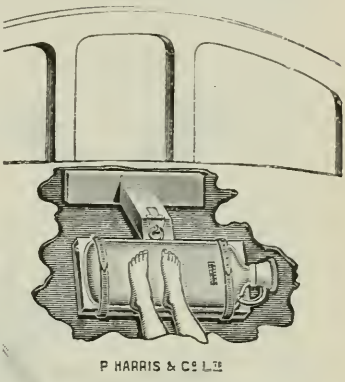


Fig. 115.

Fig. 116.

Bed Table.—This illustrates (*Fig.* 116) a steel bed-table, enamelled, the top of which measures 30 × 14 inches, and is made of fumed oak. It has the advantage over other bed-tables, in the fact that it can be folded up and packed in a box for transit. It is not only very practicable but extremely cheap. It costs 15/6, and can be obtained from the Medical Supply Association, 167–173, Gray's Inn Road, W.C.

Bottle Stand for Tuberculin.—Six narrow-mouthed white glass-stoppered bottles, half-ounce capacity, in nickel-plated stand, both the stopper and the bottle being numbered to prevent confusion, and indicating the strength of solution contained therein. Being made in cruet form (*Fig.* 117) it is handy to move, and prevents accidents to the bottles. Price complete, 8/6, from Messrs. Reynolds & Branson Ltd., Leeds.

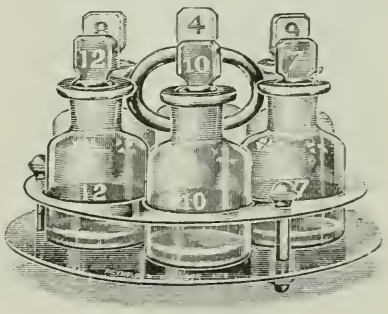


Fig. 117.

Catgut Sutures.—The Medical Supply Association, 167–173, Gray's Inn Road, W.C., send us samples of Davis & Geck catgut sutures, and also of catgut-steril (Kuhn). Both of these are easily carried in a convenient form for use. We can recommend them; and they are very carefully prepared.

Clavicle Fracture Strap.—These straps (*Fig.* 118) are designed by W. Bernard Relton, M.R.C.S., of Rugby, for treating cases of fractured clavicles in the manner suggested by Dr. Sayre, of New York, without having recourse

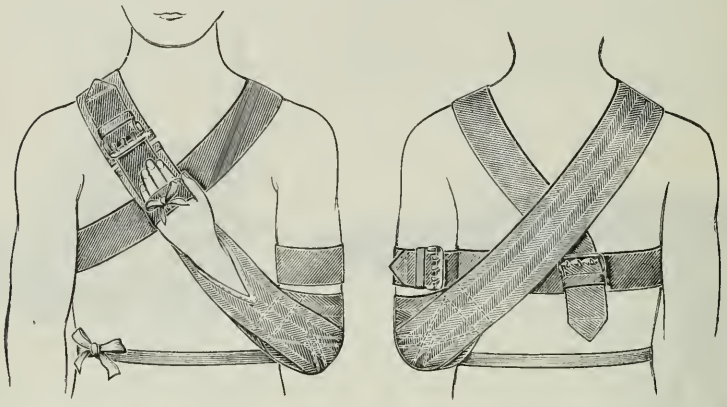


Fig. 118.

to the strips of plaster which he describes (in this sense it is a modification of the bandage suggested by Mr. T. D. Manning, B.S.); they give excellent fixation, and are easy to apply.

Directions for Use.—Place a suitable fulcrum pad in the axilla. Buckle the armlet of the thoracic band around the arm as close to the axilla as possible; the thoracic band is then passed round the patient's back, under the arm on the opposite side, across the chest, then over the shoulder of the affected side, and fastened to itself at the back, by means of the buckle supplied for the purpose. By means of this strap the humerus is made use of as a lever to carry the fragment outwards. The elbow cap, to keep the arm in the usual flexed position, support the hand, and raise and throw the shoulder backwards, is then applied as shown in the diagram. The tapes attached to the elbow cap are tied around the waist, and assist to maintain the position of the straps, and prevent movement.

A useful and practical point about these straps is that they may be applied in the different ways to suit the requirements of particular cases, and in such instances a few strong safety pins will suffice for giving the modified fixation. The makers are Down Bros. Ltd., London.

Comedone Extractor.—The Medical Supply Association, 167–173, Gray's Inn Road, W.C., send us a comedone extractor which has a smooth surface, so that when pressed on to the comedone it does not cause pain. Price 1/6.

Conversation Tube.—We noticed the "Phonette" last year as the most convenient form of speaking-tube for deaf people. The manufacturers have now added to it a hearing trumpet for general conversation. The whole appliance costs 21/-. The Medical Supply Association.

Cupper (Uterine).—The illustration (*Fig.* 119) represents a modification of the uterine cupper designed by Dr. Alexander Duke, and made by Messrs. Hewlett & Son Ltd., of Charlotte Street, E.C. This instrument, having been found most useful for the purpose for which it was designed, has been made still more practical by having a perforated nozzle to screw on the edge of cup; and being made in three

Fig. 119.

sizes, to fit the cervical canal, close exhaustion being obtained by drawing down the central rod or "plunger." The "os" and exterior of the cervix, as well as the interior, can thus be acted upon by the same instrument, the important point being to select a nozzle of suitable size to plug the cervical canal, otherwise all suction action would be lost.

Dental Flexible Applicator.—This extremely useful contrivance emanates from Messrs. Parke, Davis & Co. It is, in effect, a probe-pointed silver needle with a steel butt made to screw on to the nozzle of a metal syringe made by the same firm for the injection of pastes and ointments into pyorrhœal sinuses and fistulæ. Being made of silver, the applicator is flexible—a *sine qua non* in work carried out within a small space.

Dental Hypodermic Syringe.—(*Fig.* 120.)—(Burroughs Wellcome & Co.) This is an improved pattern of an older instrument. It is very strongly made in metal throughout, and is easily and rapidly put together for use and taken apart for cleaning and sterilization. In assembling the syringe, the barrel, cap, nozzle, and needle attachment are locked together by a simple arrangement, which does away with the use of screw-threads, washers, and other parts easily damaged or lost. In the new syringe this locking device has been much strengthened, as indeed have all vital parts, so that the durability of the instrument is even greater than before. Every part being of metal, the syringe can readily be rendered sterile, and for this purpose the metal case in which it is supplied may be used as a sterilizing tray. The syringe takes the convenient unmounted needles now so largely used. An ingenious finger-grip which can be fixed at any point on the barrel, and a screw to regulate the amount of fluid injected, give the final touches of detailed completeness to this instrument.

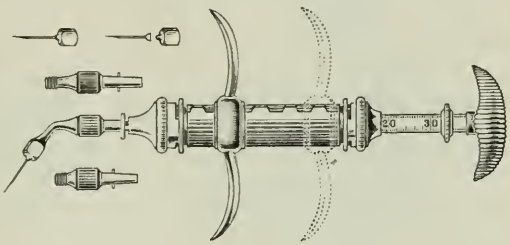


Fig. 120.

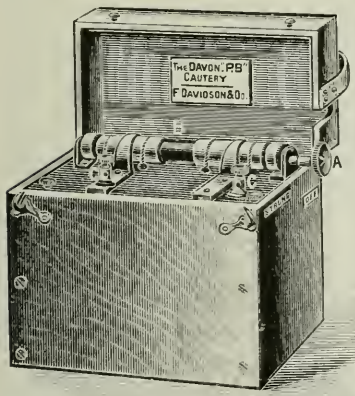


Fig. 121.

Electrical Appliances.—A new bichromate battery (*Fig.* 121) has been manufactured by Messrs. F. Davidson and Co., of 29, Great Portland Street, W. Hitherto the trouble with such batteries has been that the solution had to be renewed very frequently and kept in a tightly-corked bottle after use. This fault has militated against the use of bichromate batteries. We are glad to notice that Messrs. Davidson have overcome this difficulty to a very material extent, so that the doctor is able to do one or two cautery operations every day for three or four weeks with the same solution, without removing it from the battery. The apparatus is called *The "Davon" Portable Bichromate Cautery and Light Battery.* It provides in addition, illumination for small surgical lamps (4 volts). It is small in

size, and, unless it is turned upside down, practically unspillable, and only weighs when charged 16 lbs.

The thumb screw " A " provides a means of manipulating the carbons and zincs, and is also in itself a rheostat for regulating the amount of heat or light being used, so that no energy is wasted through wire resistances.

There can be no doubt of the utility of such an appliance, especially in country practices, and it can be safely recommended.

Bergonié Apparatus.—This was originally designed for the treatment of obesity. It consists essentially of an apparatus for producing muscular contractions over a large surface of the body by means of a faradic coil, the contractions being regulated by a metronome which can be so arranged as to produce the required number per minute. The appliance used is described as " an induction transformer specially wound to produce the maximum of muscular contraction with the minimum of sensation."

When we were constructing an apparatus to fulfil this object twenty years ago, we found an ordinary " coarse wire primary coil " suit our purpose very well. This is a coil with very thick wire. In order to reduce the sensation it is well to have the electrode to cover as large a surface as possible, and to be well padded.

Dr. Bergonié has carried this idea further: instead of using two large electrodes, he uses a large number simultaneously, which are placed in contact with the flexor surface of the arms, legs, thighs, abdomen, and back. These are made of brass, shaped to fit the part to which they are applied, and a special chair is supplied in which the patient sits. We have always used electrodes of sheet lead, which not only adapt themselves more easily to the part, but by their weight preserve the contact. We also find it convenient to have the patient lying upon an ordinary couch or bed.

Dr. Bergonié has designed a very elaborate switchboard, which can be worked " in connection with the town supply if the current is continuous." We prefer to work our coil with a couple of large dry cells, which will give all the muscular contraction required, and under much safer conditions.

We make these remarks because the cost of the Bergonié apparatus is £72. which debars the ordinary practitioner from employing it.

After twenty years' experience of this method of treatment, we can attest its value, not merely in cases of obesity, but in all conditions where it is required to stimulate muscular contraction. Thus, for chronic constipation due to muscular atony, gastro-enteroptosis, and floating kidney, it is one of the most valuable remedies we have. Its use in cases of paralysis and muscular debility is self-evident.

Another important indication for this treatment is in cardiac dilatation with rapid heart beat. This is due to the fact that the heart readily responds to the rate of contractions set by the metronome. Thus, if these beats are ten to the minute less than the pulse, the pulse will usually become synchronous with the beats of the metronome. Our apparatus consists of an ordinary large coarse wire primary coil and metronome, some dry cells, and electrodes made from sheet lead. We also use a rheostat to give exact control over the contractions. The Bergonié apparatus is very elaborate and complete, and can be adopted in institutions where such an installation would be desirable; but we are strongly opposed to the idea that the practitioner should be debarred from a valuable method of treatment because the purchase of the apparatus is beyond his means. The Bergonié Apparatus can be obtained from the Medical Supply Association.

Electrical Apparatus (Combined).—Under the name of the " Politherap," the Medical Supply Association have produced a combined galvanic faradic light and cautery apparatus similar to the "Multostat" described in previous issues, but claiming in addition to give an *x*-ray outfit. " With this machine perfect radiograms of the limbs and chest are obtainable." This claim must be closely examined before we can admit it. We all know that efficient radiograms can only be produced by much larger coils with longer sparks than this

apparatus gives. We have had no opportunity of examining the apparatus, and while we have no doubt of its efficiency in respect to the other claims made for it, we should require very careful examination before we could recommend it to practitioners who require an *x*-ray outfit.

Eye Drop-bottles.—We illustrate here (*Fig.* 122) a cruet-stand type of holder for eye drop-bottles made by the Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.

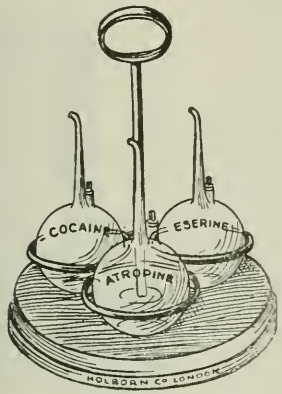


Fig. 122.

Fig. 123.

Eye Irrigation Syringe (Colburn's).—The improvement in this syringe (*Fig.* 123) is the collar, by means of which it can be kept air-tight. Rubber loses its elasticity in time, especially in India; and with this clamp collar, the syringe can always be kept ready for use. It has a very fine silver pipe, and is excellently adapted for its purpose in every way. Cost 4/-. Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Gas Lighter.—This is a little novelty that we find useful in our laboratory for lighting Bunsen burners, etc., without matches or taper. It will be found convenient for those who have no electric light in their houses or surgeries, as it can be attached to almost any gas jet. By pressing the finger on the wheel so as to give it a sharp half-turn, sparks are immediately evolved, which light the gas if previously turned on. Price 1/- each; 9/- per dozen. Messrs. R Sumner & Co., 50*a*, Lord Street, Liverpool.

We have received a similar article from the Medical Supply Association, 167–173, Gray's Inn Road, W.C.

Gloves (Washable Cotton).—In these gloves the seam at the extremity of the finger is carried over to the back, so that the sense of touch is fairly well retained. They are very useful for nurses, anæsthetists, etc., being well made and very practical. They cost 15/- per dozen pairs. Messrs. R. Sumner & Co., Lord Street, Liverpool.

Hay Fever Reaction Outfit.—This has been devised by Messrs. Parke, Davis & Co., in order to facilitate the diagnosis of susceptibility to hay fever by ophthalmo-reaction (*see* HAY FEVER, p. 277). The outfit consists of a series of capillary tubes, coloured differently to prevent accidents, containing a gradation of strengths of watery extract of *Phleum pratense* pollen, together with a teat and file. It is designed to furnish not merely a qualitative but also a quantitative test of susceptibility. Very full directions are supplied.

Hedonal Apparatus.—This apparatus (*Fig.* 124)—suggested by Dr. C. G. Schlesinger—is a modification of that employed by Rood, and consists essentially of three parts: (1) The reservoir; (2) The combined dropper, warming tube, and bubble-trap; (3) The cannula. The warming apparatus consists of an inlet after the style of Dr. Laurie's saline drop indicator, leading into a warming chamber. The rate of flow can be estimated from the fact that the number of drops passing through it in $7\frac{1}{2}$ seconds indicates the rate of flow in ounces per hour. As the tube for conducting fluid from the warming chamber reaches to the bottom, there is no danger of bubbles of air or evaporated ether being carried over into the patient's circulation.

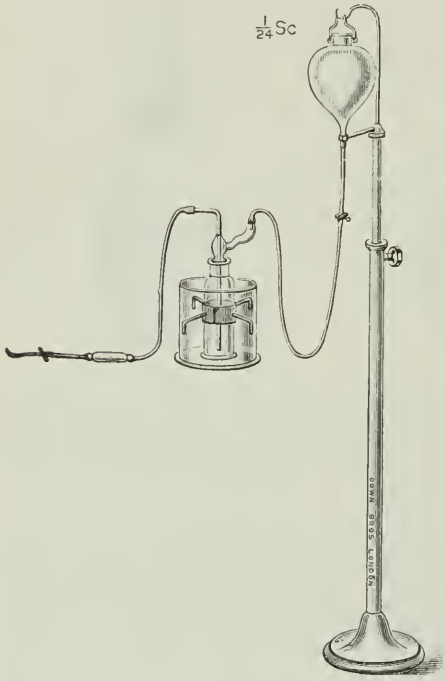


Fig. 124.

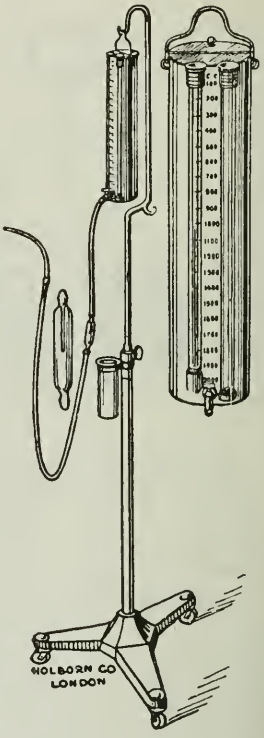


Fig. 125.

The warming chamber is contained in an outer glass vessel, which is filled with water at a temperature below 100° F., as above this the ether evaporates. The cannula is of silver, and close to it is inserted a small glass bubble-trap, which also serves to give immediate warning of any regurgitation of blood. The reservoir is suspended from a stand at a height of between three and four feet above the patient, and a screw clip on the tube leading from it controls the rate of flow.

A graduated glass mixing-flask is provided with the apparatus, the graduations on which show at a glance the amount of saline diluent required for making the necessary quantities of 5 per cent solution. There is, further, the important advantage that the whole apparatus can be sterilized by boiling. Messrs. Down Bros. Ltd., London, are the makers. from whom all further particulars can be obtained.

Another arrangement (*Fig.* 125) was suggested by Mr. C. M. Page, F.R.C.S. It consists of a stout nickel-plated cylinder, 15 by $3\frac{5}{8}$ in., of 2,000 c.c. capacity,

with a water gauge, and thermometer let in at the side. The container is graduated to 2,000 c.c in divisions of 100 c.c., and is provided with a regulating tap, hinged lid, and a folding wire handle, which can be attached to a hook or any suitable stand. A length (about 5 ft.) of pressure tubing is fitted to the nozzle of the tap, an all-glass regulating drop-tube inserted about 12 in. down, and a silver cannula at the end. The amount of solution infused is clearly shown by the water gauge, and graduations are marked on the container. The flow can be regulated by means of the tap, and the rate at which it is running can be seen in the drop-tube. The thermometer shows the temperature of the solution in the container. This is made by the Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, E.C.

Messrs. Reynolds & Branson, of Leeds, also supply an apparatus for administering hedonal. This is a copper cylinder, nickel-plated, graduated to 2,000 c.c., with thermometer and water gauge, special vertical tap with indicator, indiarubber tubing, glass dropper, and metal infusion cannula, having beneath a novel insulated heating-chamber, a long cylindrical electric lamp being used to accurately maintain uniform temperature. It may be regulated by partially withdrawing the lamp. Complete with 2 yards of flexible wire and plug. Price 63/-. The apparatus is equally useful for keeping any solution required for injection at a uniform temperature. It is an appliance for which constant use would be found both in the hospital wards or in private practice, as it solves a difficult problem.

Hypodermic Syringes.—A large number of syringes have been brought under our notice during the year. They show great improvement in mechanical efficiency and durability over the models of a few years ago. The solid piston has now become general, and we should not think a syringe worthy of notice that had any arrangement that became inefficient when the syringe had not been used for a little while. All the syringes have also metal mounts to receive the needle. With the all-glass syringe the nozzle, when the metal end of the needle was applied to it, frequently broke.

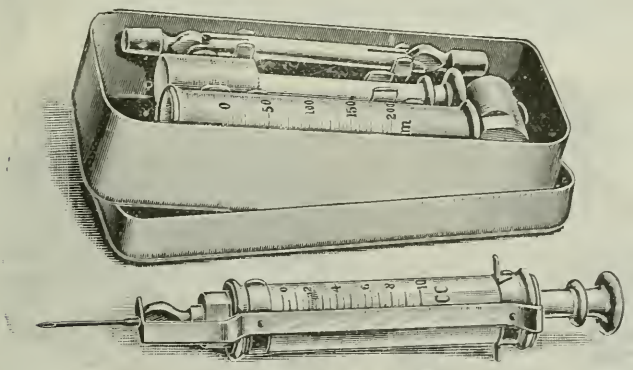


Fig. 126.

We decided not to notice any more of the all-glass syringes, since we regard them as unreliable, but Dr. Dalal, of Bombay, who shares our view, has contrived to get over the defect in a very ingenious way. He has constructed a serum syringe (*Fig.* 126), in which the barrel is a glass tube, and into one end of this is placed a solid glass stopper with a hole through the centre, enlarged at the distal end, so that the needle fits into it like a plug. This quite overcomes the difficulty of the fragile nozzle, and makes the syringe quite efficient. He also has designed a metal

holder with finger-rests, which prevents the piston from being withdrawn, and also the nose-piece from being pushed out, which frequently happens with syringes of this pattern. We think one of the needles supplied might with advantage have a smaller bore and be somewhat longer. This point could be easily arranged with the manufacturers, Messrs. R. Sumner & Co., Liverpool.

All the following syringes can be recommended, as they each have some convenience to meet special requirements.

A *Tuberculin Syringe* (*Fig.* 127), with a capacity of 1 c.c., graduated in $\frac{1}{20}$ths, fitted with a long glass barrel and metal piston having graduated rod

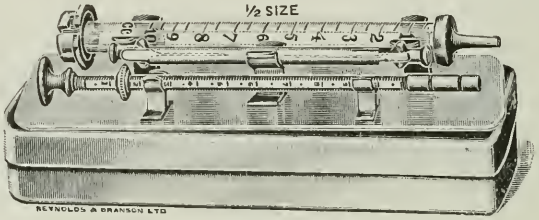


Fig. 127.

with check screw. The barrel has a fine bore, making the divisions easily read, and allowing the tuberculin to be measured and diluted with great accuracy. Complete in metal case with two needles, price 12/6. Messrs. Reynolds & Branson, Leeds.

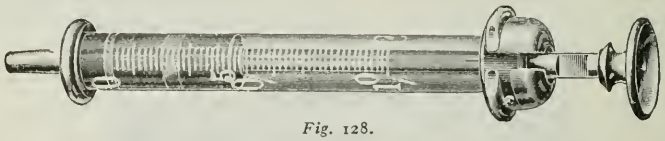


Fig. 128.

A similar syringe, with capacity 1 c.c., graduated in $\frac{1}{50}$th parts, made of glass and metal only, is supplied by the Medical Supply Association, 167–173 Gray's Inn Road, W.C., for 8/6. (*Fig.* 128.)

The asepsis of syringe and needle is provided for by an arrangement by which the whole syringe and needles are immersed in a glass vessel containing absolute alcohol or Brytstele. We noticed an arrangement of this kind supplied by Messrs. R. Sumner & Co., of Liverpool, in our last issue; it consisted of a syringe with six needles of different lengths immersed in solution. We have tested this syringe for twelve months in Brytstele solution, and it is as bright to-day as when it came from the makers.

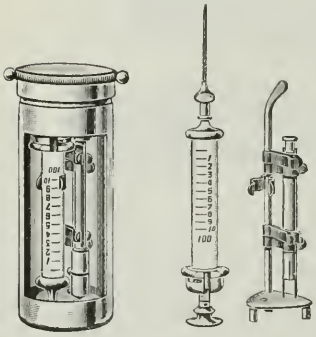


Fig. 129.

Messrs. Philip Harris & Co., of Birmingham, have an arrangement of this kind (*Fig.* 129), with a screw metal cap designed to hold a syringe and two needles immersed in alcohol or Brytstele. It contains the Harris Record Syringe, with capacity of 1 c.c., graduated in $\frac{1}{10}$ths, or capacity of 20 minims, plainly graduated. It costs 10/6.

The Holborn Surgical Instrument Co., 26, Thavies Inn, E.C., also have a similar arrangement with Record syringe and two needles, which may be immersed in either alcohol or Brytstele, which they supply at a cost of 8/–.

We strongly recommend this method of keeping syringes aseptic. They are usually required in a hurry, and the ordinary method of sterilizing is too time-wasting to be always efficiently done. It is important before use to wash and syringe out the alcohol or Brytstele with water freshly boiled, or straight from the hot-water tap. The latter provides the best sterilized water.

Messrs. Ferris & Co., of Bristol, also supply an excellent syringe with two needles in a metal or metal and glass case, suitable for immersion in alcohol or Brytstele, at a cost of 9/–. It is extremely portable and practical, and we can strongly recommend it.

Hypodermic Cases.—Messrs. Ferris & Co , of Bristol, appear to have made a speciality of hypodermic cases containing all that may be required to meet emergencies in a most portable form. *Fig.* 130 illustrates a very nice case of this sort, containing a syringe (20 minims), two steel needles, a glass mortar and pestle, and six tubes of hypodermic tablets, in a very neat gun-metal case. This costs 12/6. Unfortunately the syringe sent us is all-glass, and we cannot recommend it. We understand that Messrs. Ferris & Co. will supply a glass and metal syringe with this case to those who, like ourselves, prefer it.

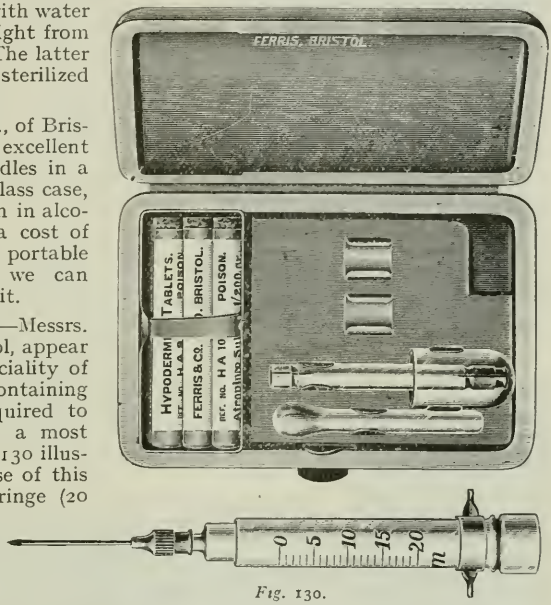


Fig. 130.

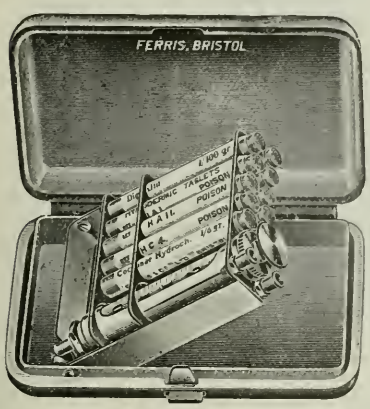


Fig. 131.

Another excellent arrangement made by Messrs. Ferris & Co. (*Fig.* 131) allows ten tubes of hypodermic pellets to be carried in the pocket to meet emergencies. This syringe has a removable metal nozzle, and is in every way perfect. The great advantage of the case is that the syringe, the needles and the tube of tablets are placed in a rack which can be lifted out of the case, so that there is no trouble in taking out the tube required and putting it back. It is highly practical. The whole is put up in a neat metal case, and costs 15/–.

Messrs. Ferris & Co. have also carried out the idea of the lift-out racks

in a syringe with two needles, without the hypodermic tablets. It contains 20 minims, and has a graduated piston. This costs 8/6.

Some practitioners prefer hypodermic injections in ampoules, as they consider they are safer than tablets, as regards sterility, accurate dosage, etc. Messrs. R. Sumner & Co., Liverpool, have produced a hypodermic syringe in metal case with compartments for ampoules (*Fig.* 132). There is a small ring at one end of the case to hold one of these in an upright position when the syringe is being filled. The latter is one of the well-known "Record" pattern, graduated either in minims or tenths of a c.c. for tuberculin injections. Two steel needles are supplied with each instrument. The complete case costs 15/-.

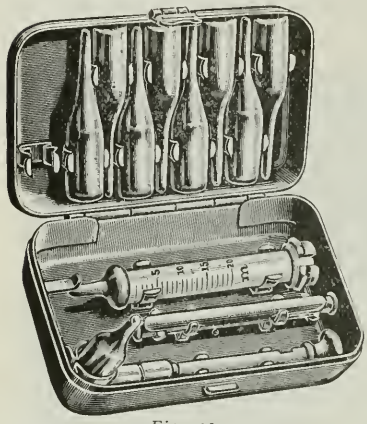


Fig. 132.

Ice Cradle.—This apparatus (*Fig.* 133), has been made at the suggestion of Miss K. C. Braidwood, Matron of the Hospital for Infectious Diseases, Mylands, Colchester, for the reduction of the temperature in cases of enteric fever. The cradle is in the form of a light metal framework, from which are suspended eight ice-pails, supplied with strainers and with flannel covers fitted to the lower part of the pails. These caps absorb the moisture due to condensation, so that there is no dripping. The arrangement of patient

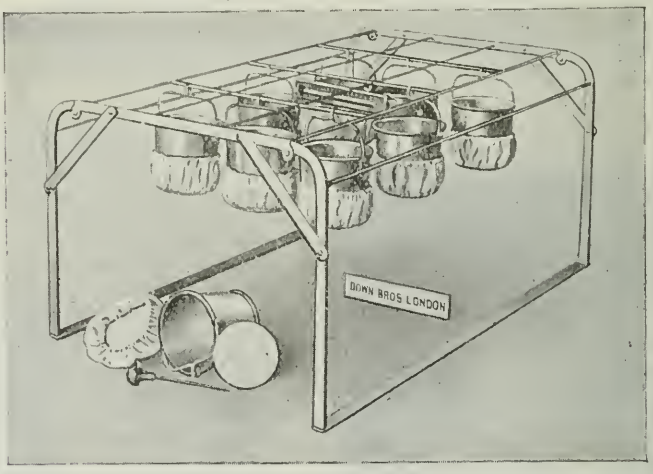


Fig. 133.

and cradle is as follows: The patient wears a flannel gown and bed-socks, or is covered with a thin blanket, and has a hot-water bottle at the feet. The cradle is then adjusted (well up over the trunk), and the pails are attached and the thermometer put in place. Two blankets are arranged over the cradle to open in the middle, so that the cradle temperature can be noted

without any inrush of air. As the temperature begins to drop, one or more pails can be removed, so that the patient does not get chilled. As a rule the cradle is put on when the patient's temperature is 102° F. and removed when it has dropped to 101°. With temperatures over 103°, the plan followed has been ten minutes preliminary sponging, followed by applying the cradle, which will bring down the temperature more quickly. The nurse notes the recorded cradle-temperature each time when taking the patient's temperature, and keeps the ice-pails replenished. This is only the work of a moment if two bowls, one containing a supply of chipped ice and one empty, for draining the pails, are taken to the bedside. The makers are Messrs. Down Bros. Ltd., London, S.E.

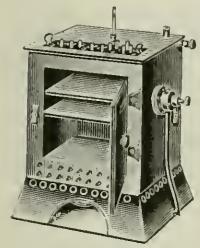


Fig. 134.

Incubators and Sterilizers (Anhydric).—Electric incubators can be successfully heated by electric lamps, but as the life of an electric lamp is of comparatively short duration, and always an uncertain quantity, Mr. Hearson has for some time past directed his efforts to the production of a more satisfactory form of heat. He now makes electrically-heated incubators, baths, sterilizers, and drying ovens, working on a principle essentially different from that hitherto in use, inasmuch as the heating effect is produced by an even distribution of one or more electric resistance wires, covering every part of the apparatus formerly occupied by the water-jacket. The apparatus is regulated by means of Hearson's patent capsule, and constant temperatures can be obtained at any degree. Incubators 22° and 37° C., baths 45° to 60° to 75° or 100° C., drying ovens 90° to 110° C., and sterilizers 150° to 175° C.

Mr. Hearson also makes a new combination incubator (*Fig.* 134) to meet the requirements of bacteriological work. It consists of an incubating chamber (size 9in. × 7in. × 7in.) and a number of tubes surrounded by water, to take pipettes for the determination of opsonic indices. It is supplied with a tray for the Wassermann reaction, the tray being placed in an opening at the top, which is immersed in the water. It is strongly made of copper, and is fitted with patent thermostat and capsule, and can be obtained heated either by gas or oil at a reasonable price. Messrs. Chas. Hearson and Co. Ltd., 68, Willow Wall, Bermondsey, S.E.

Infusion Apparatus.—With this model the saline infusion may be placed inside the bag, and the whole apparatus placed in the sterilizer, together with the needles, tubing, etc. After the sterilizing process the instrument should be removed, cooled slightly by placing in cold water, and then hung up, when the subcutaneous infusion commences immediately. With this method there is no danger of the contents coming into contact with anything of a septic nature after sterilization. This is the latest pattern adopted by Mr. Arbuthnot Lane. It is made by Messrs Allen and Hanburys Ltd., 48, Wigmore Street, W. (*Fig.* 135.)

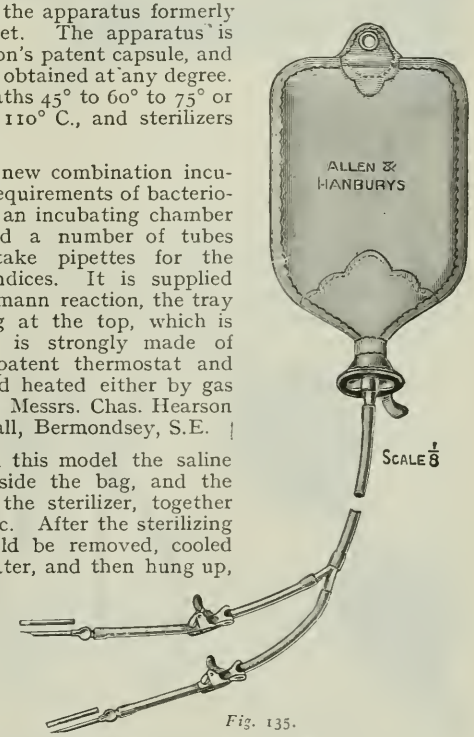


Fig. 135.

Souttar's Infusion Apparatus claims the advantage over other forms of saline infusion apparatus, that the temperature of the solution remains almost constant for a considerable length of time, losing only about one degree per hour. The apparatus is largely used in the London Hospital, as well as in other parts of the United Kingdom. It can be employed equally well for either subcutaneous or rectal infusion. This is also supplied by Messrs. Allen & Hanburys Ltd.

Inhalers.—We illustrate (*Fig.* 136) a new *Open Method Inhaler*, which has many points to recommend it. The anæsthetic is effectively warmed without rebreathing. It has an automatic drop-bottle attachment, which provides that the ether or other anæsthetic is automatically dropped upon the sponge at any required speed. The result is that the quantity of the anæsthetic used is reduced, in comparison with the open methods, and the combination or sequence of ether, A.C.E., chloroform, or ethyl chloride, with nitrous oxide and oxygen, is practicable. It is made by the Medical Supply Association and costs, 42/–.

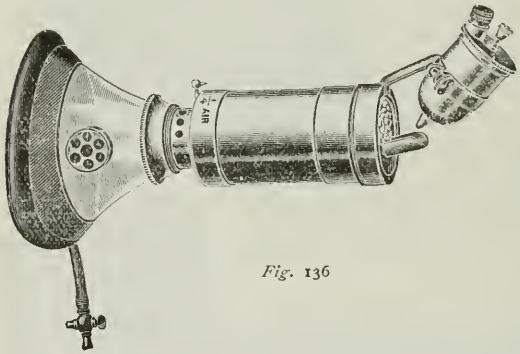


Fig. 136

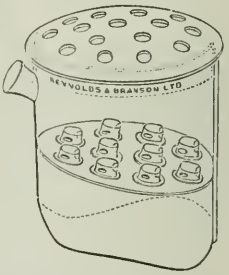


Fig. 137.

Axtell's Chloroform Inhaler.—This modification of the diaphragm consists of raised portions of celluloid, with apertures at the lower end for entrance and at the top for exit. By this means fluid is prevented from coming in contact with the patient's face, only vapour passing through. (*Fig.* 137.) Price 12/6. Messrs. Reynolds & Branson, Leeds.

Fig. 138.

Chloroform Inhaler.—This apparatus (*Fig.* 138), on the principle of the

Junker chloroform inhaler, is designed by Dr. R. M. Rowe, to simplify the simultaneous administration of oxygen and chloroform. A short cannula at the extremity of the bellows system plugs into the tube leading from the oxygen cylinder. The bellows consists of two bulbs, each of the capacity of 100 c.c.; the first bulb is provided with an inlet valve. The chloroform chamber is fitted with oxygen inlet and chloroform vapour outlet tubes. These tubes are connected outside the chamber by a short-circuit tube controlled by a simple tap. By closing this tap the current of oxygen no longer passes through the chloroform in the chamber, but is delivered through the short circuit directly to the face-piece free from chloroform vapour. The apparatus is carefully constructed by Messrs. Mayer & Meltzer, 71, Great Portland Street, W.

Ethyl-Chloride Inhaler (*Fig.* 139).—This has been designed by Mr. L. Kirkby Thomas for the continuous nasal administration of ethyl chloride. The Inhaler consists of a nose-piece with rubber face-pad connected by a wide-bore metal tube to a rubber bag. A small metal tube terminating in a nipple is fixed obliquely into the wide-bore tube a short distance from the nose-piece. A short length of thick-walled rubber tubing is attached by one end to the nipple, while the nozzle of an ethyl-chloride container is inserted in the other end. To use the apparatus, the nose-piece is fitted accurately over the patient's nose, the wide-bore tube passing upwards over the forehead, while the bag hangs behind the head. By pressing the valve in the nozzle of the container, held in the left hand, ethyl chloride vapour passes up into the wide-bore tube and is inhaled by the patient. Anæsthesia having been induced and the operation proceeded with, the nose-piece should be lifted every six inspirations to allow a breath of air. On the average, induction takes place in about one-and-a-half minutes at the expense of 4 or 5 c.c. ethyl chloride, while for an operation lasting, say, from ten to fifteen minutes, the amount of ethyl chloride used works out at about 1 c.c. per minute.

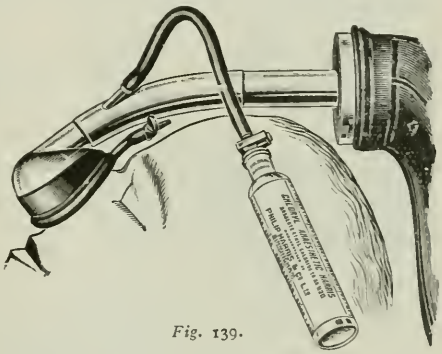


Fig. 139.

The apparatus is made by Messrs. Philip Harris & Co., of Birmingham.

Invalid Lifters.—Mr. Skeffington, of 49, Ulundi Road, Blackheath, S.E., sends us particulars of a number of his appliances designed for lifting the helpless patient. The ingenious nature of the method employed can be best explained by reference to the illustrations (*Figs.* 140 to 143).

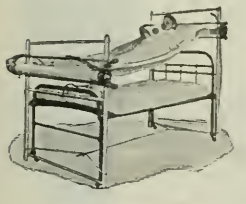


Fig. 140.—Lifts for Making Bed Underneath.

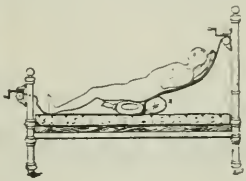


Fig. 141.—Lifts on Cushion for Bed Pan.

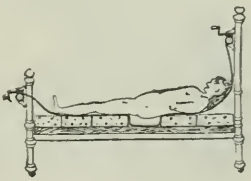


Fig. 142.—Lifts for Bed Pan, with Sectional Mattress.

The Skeffington *Sacrum Lifter* enables one person to quite easily and painlessly lift the heaviest patient's sacrum for: (1) Placing the bed-pan; (2) Relieving or ventilating a bed-sore; (3) Changing a draw-sheet; and (4) It will also turn a patient on one side and so hold him, thereby enabling one

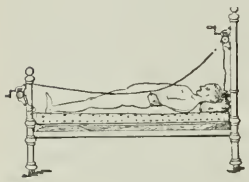


Fig. 143.—Lifts Sacrum for Bed Pan and changing Draw Sheet.

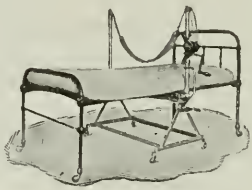


Fig. 144.—Portable Type of Sacrum Lifter.

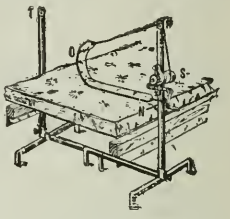


Fig. 145.—Turns Patient on one side.

person to do the work that usually requires two. It is therefore not only a comfort but an economy. It is made in two types, the "mobile" and the "portable." Either type can also have a bed-table attached to it. Its mechanism will be readily understood from the annexed illustrations (*Figs.* 144 and 145).

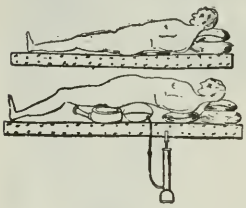


Fig. 146.—Lifting Cushion and Pump.

Mr. Skeffington has also designed a *Fracture Mattress,* which is made up in sections, each of which may be made to collapse by simply turning a handle, making a cavity across the mattress when required. This enables the bed-pan to be used or dressing carried out without lifting the patient.

Another invention is a *Lifting Cushion* (*Fig.* 146), which when deflated is drawn under the patient's back, and then inflated by means of a pump. The patient's body is thus raised so that the bed-pan can be introduced.

Iodine Tincture Bottle, with Glass Brush.—Hitherto the medical practitioner has had no reliable portable vessel for holding odine tincture ready for an immediate application. The ordinary glass bottle with a brush in the cork had many drawbacks. The cork and brush are soon attacked and destroyed by the escaping iodine vapours. These evils are obviated by this iodine bottle with glass brush, which has a glass stopper. There is no evaporation, and the iodine tincture will remain of its normal concentration. Price, complete in boxwood case, 2/9 each, from the Medical Supply Association.

Fig. 147.

Knee Stay (Lawless').—*Fig.* 147 illustrates a new form of knee stay which is most efficient in retaining loose cartilage. It is easily adapted to any case, and supplies a much needed want. The cost is 21/-. The manufacturers are the Medical Supply Association.

Laryngeal Mirrors.—A distinct improvement in these mirrors is the larger size of the hole in the centre through which observations are made. This is well shown in the illustration we give of one supplied by Messrs. Reynolds and Branson, of

Leeds (*Fig.* 148). The mirror has a ball-and-socket joint, which is attached to a light spring head-band. It is made of aluminium, and is thus very light. The special advantage of this mirror is that the whole packs into a circular case of aluminium, so that it can be carried about without fear of injury or breakage. This costs 12/6.

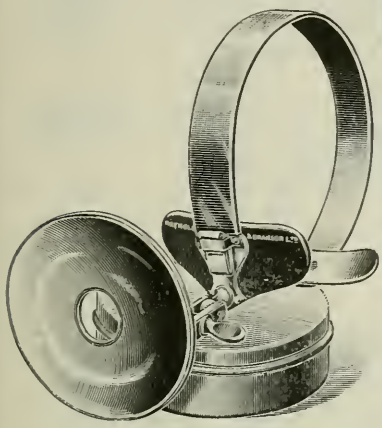


Fig. 148.

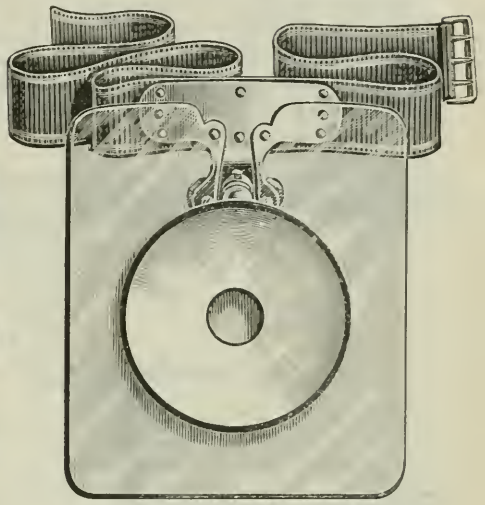


Fig. 149.

The same large opening in the centre of the mirror is shown in the laryngeal mirror sent us by Messrs. R. Sumner & Co., of Liverpool (*Fig.* 149). This is also furnished with a celluloid shield, which protects the operator from the exhalations of the patient. This, with head-band complete, is supplied at 15/-.

Another idea in respect to laryngeal examinations is to supply a celluloid protection in conjunction with a light for examination, supplied by a portable battery. This is shown in the appliance supplied by the Holborn Surgical Instrument Co. (*Fig.* 150). This can of course be used in conjunction with a laryngeal mirror, and this the firm will supply.

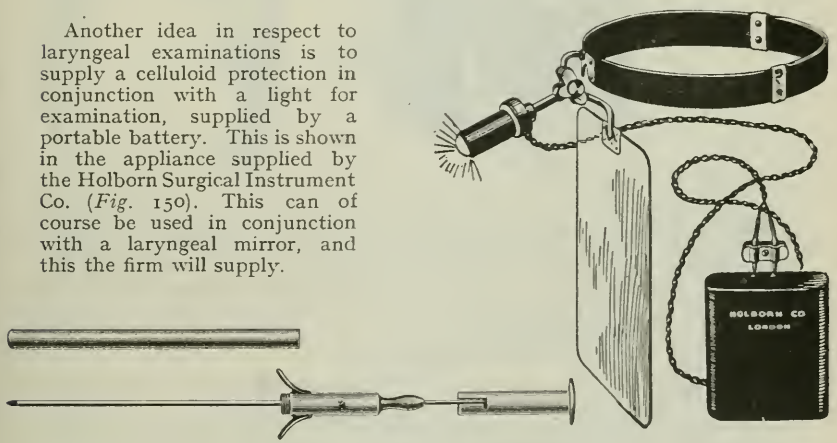


Fig. 151.

Fig. 150.

Lumbar Puncture Needle.—We illustrate here (*Fig.* 151) a new lumbar puncture needle designed by Dr. Williamson, Pathologist to the Bristol General Hospital. It consists of a tubular needle the entire length of the

instrument, with a steel stilette filling the lumen, and a protecting cap. It is a perfect instrument for lumbar puncture. It is manufactured by Messrs. Ferris & Co., of Bristol, and costs 8/6.

Mastoid Forceps.—The instrument illustrated in *Fig.* 152 is devised by Mr. J. Gay French to rapidly remove the "bridge" over the aditus in the radical mastoid operation. The tip of the distal portion is put through the aditus exactly in the same manner that a Stacke's protector is used, and with two cuts the bridge of bone is easily and rapidly removed. The time taken over the operation is shortened, and any danger of injuring the facial nerve is reduced to a minimum. Messrs. Mayer & Meltzer, Great Portland Street, W., are the manufacturers. Price 35/-.

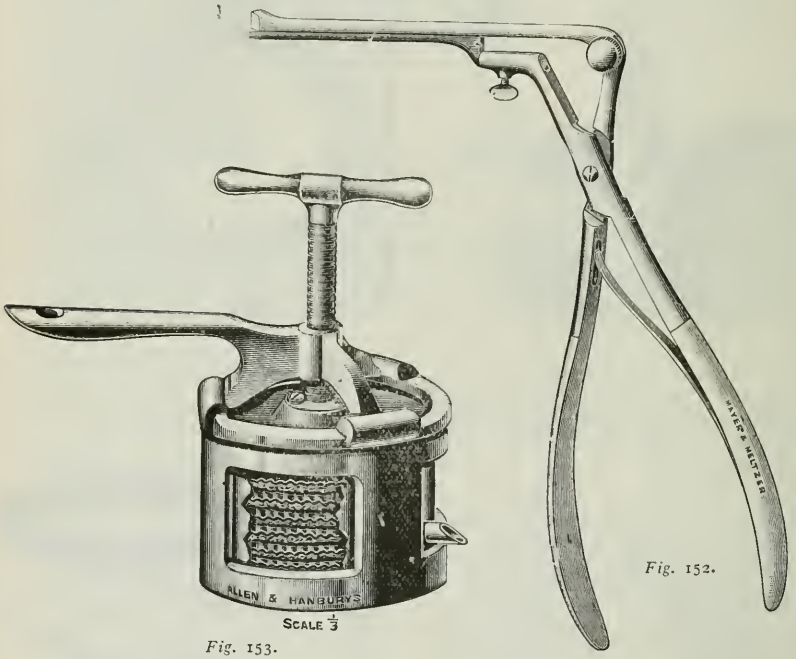


Fig. 152.

Fig. 153.

Meat Press.—This is a new form of meat press strongly recommended, and it is an improvement on other patterns (*Fig.* 153). Originally of foreign manufacture, it is now made by Messrs. Allen & Hanburys, and sold for about half the price at which it can be obtained from abroad. The value of an efficient meat press is well recognized in these days, when raw beef-juice is the essential treatment of anæmic conditions, and we are glad one has been produced at a reasonable price.

Milk Tester.—A simple milk tester for family use has been sent us by the Medical Supply Association, 167–173, Gray's Inn Road, W.C. It offers a ready means of detecting any dilution that may have been made in milk, and should be recommended to householders. They cost 9/- per dozen.

Mouth-Gags.—The mouth-gag devised by Dr. Phillips is an improvement on a pattern largely used on the Continent. This consists of the addition of an anæsthetic tube (*Fig.* 154). The gag can be used in any part of the

mouth and the anæsthetic administered at the same time, the anæsthetist being well out of the way of the operator. It is manufactured by Messrs. Allen & Hanburys, Wigmore Street, W., who also supply :—

Paget's Hollow Mouth Prop and Artificial Air-way (*Fig.* 155).—This instrument consists of a boxwood wedge as originally suggested by Hewitt, attached to which, by means of a chain, is the mouth-prop or artificial air-way, which can be fixed in any part of the mouth and used on patients of any size.

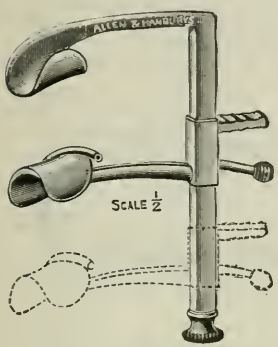


Fig. 154.

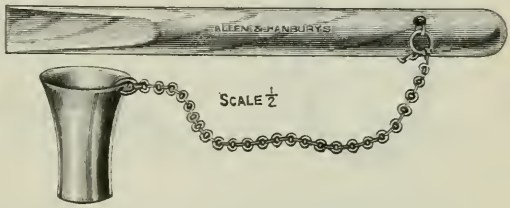


Fig. 155.

The Mouth-Gag designed by Dr. O'Malley (*Fig.* 156) is a modification of Doyen's. With gas anæsthesia it is applied before the face-piece. (1) It lies close to the left cheek to avoid much escape of gas and delay in the anæsthetic. (2) To be as secure as possible against slipping out of the patient's mouth in any of the movements of the head required during the operation, it is provided with flanges. (3) When in position and holding

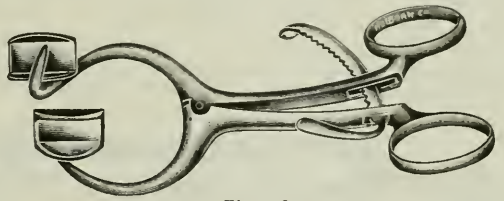


Fig. 156.

the patient's mouth open, it allows sufficient space between its blades for the free movements of the tonsillectome. (4) The leverage is applied laterally in the mouth, and not in the incisor region. This enables the operator to bring the adenoid curette out in a short curve and in the middle line. He is therefore less likely to injure the nasopharyngeal mucous membrane or Eustachian cushions than if the stout blades of a gag are resting against the incisor teeth. It is manufactured by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

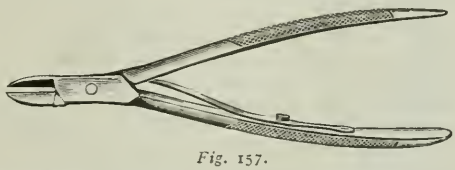


Fig. 157.

Nail-cutting Forceps.—This little instrument (*Fig.* 157) is intended for cutting off the corners of ingrowing toe-nails, but can be used as an ordinary

nail-clipper It is so nicely made and so effective that we think most of our readers will consider it a very desirable purchase. It costs 4/-. Messrs. R. Sumner & Co., Liverpool.

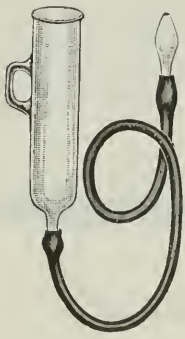


Fig. 158.

Nasal Douche (Improved).—This is an ideal little instrument; the cylinder and nose-piece are of glass; consequently cleanliness is assured (*Fig.* 158). It is both safe and effective, and the price is most moderate, viz., 1/6. Messrs. R. Sumner and Co., Liverpool.

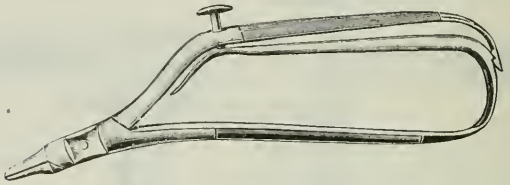


Fig. 159.

Needle-holders.—There are so many different patterns of needle-holders, that one would suppose the last word had been said on the subject; but notwithstanding, the instrument under notice possesses one decided advantage over most of those in general use, and that is the great facility with which the spring holding the jaws together is released. To do so it is only necessary to lightly press on the thumb rest (*Fig.* 159). The instrument is most suitable for using with needles for fine face-work. The jaws are so finely pointed that the view is not obstructed. It is made with detachable joint, and easily rendered aseptic. We like it better than any other needle-holder we have used. Price 10/6. Messrs. R. Sumner & Co., Liverpool.

This is an *Eye Needle-holder* (*Fig.* 160) designed by Dr. A. C. Norman, which claims as an advantage that no catches are to be released whatever needle-holder is in use. The needle is released by pressure upon the handles.

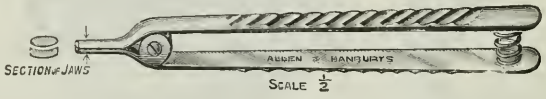


Fig. 160.

This is the ordinary principle in most needle-holders, and we personally prefer the gentle pressure upon a button, when doing a delicate operation, which we have described in the instrument above. We have not examined this holder, which is made by Messrs. Allen & Hanburys, Wigmore Street, W.

Ozonair Apparatus.—The ozone generators manufactured by Messrs. Ozonair Limited are the outcome of several years of research and experience, with the object of putting on the market a portable and handy ozone generator, capable of being connected easily to an electric-light circuit, or to work with a small accumulator, for the purpose of producing *pure* ozone in commercial quantities, entirely free from all deleterious compounds.

The ozone thus obtained is quite pure. It is generated by stepping up the alternating current to a high voltage, and by connecting the two secondary terminals of the special transformer used for this purpose to opposite plates of a special condenser. The elements of this condenser are made in a form suitable for the purpose, and consist of two layers of fine metal gauze separated by micanite. The result of the high tension between the two gauzes is to cause a silent discharge or glow. The apparatus also contains a small electric

fan for the purpose of drawing the vitiated air of the room over the condenser plates, and this causes part of the oxygen in the air to be ozonized, the ozonized air then being projected out of the other side of the apparatus into the room. Where alternating current is not available, the fan motor is constructed in the form of a rotary convertor, so that whilst the continuous current drives the fan motor, the alternating current for the condenser is collected from a special commutator on the spindle of the motor.

The cost of installation can be reckoned for small rooms at from £9 to £13, depending upon whether the alternating current is provided; but the current consumption when installed is very small—about one unit of electricity in forty to fifty hours.

The "Ozonair" apparatus has been used with advantage in cases of phthisis and diseases of the respiratory tract. In these cases the ozone is directly inhaled. It has also been used by means of a special apparatus as a direct application to wounds. The value of ozone will appeal to the practitioner for many purposes, and we are glad that an efficient apparatus has been designed for its production. Ozonair Limited, 96, Victoria Street, S.W.

Operating-table.—The "Grevillite" Portable Folding Operating-table (*Fig.* 161), gives the Trendelenburg and all other positions required for gynæco-

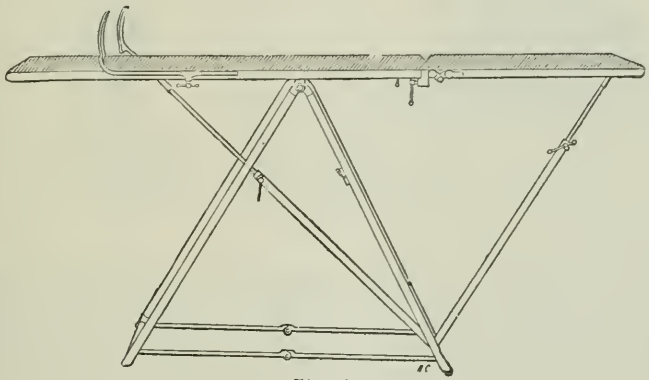


Fig. 161.

logical operations. It is so constructed that all movements are controlled by the two telescopic rods, which may be set to any position by set screws. It is very portable, folds into a small space, and is supplied at the moderate price of £7 10s. by the Medical Supply Association, London.

Pessaries.—A pessary for complete prolapse of the uterus is suggested by Dr. Louise McIlroy, of Glasgow. The advantages claimed for this are, that the perineal band is washable, and the vulcanite pessary supports the uterus or vaginal walls at the lower end of the vagina. The opening in the centre of the pessary allows for drainage (*Fig.* 162). This is manufactured by Messrs. Allen & Hanburys, Wigmore Street, W.

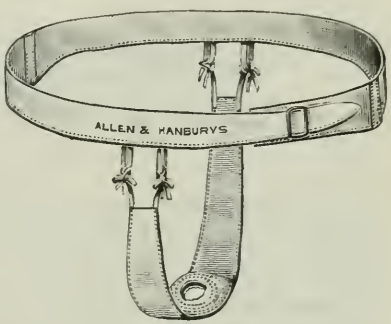


Fig. 162.

¶We illustrate in *Fig.* 163 one of Napier's well-known pattern, the stem of which is rendered more rigid by a concealed non-rusting German-silver rod, which gives a much greater degree of support than the original model. The under straps are also more easily detached for renewal or cleaning. It is made in four sizes, from 5/6 each. Messrs. R. Sumner & Co., Liverpool.

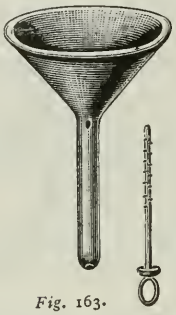


Fig. 163.

¶We all know that when introducing a ring-pessary it has a tendency to slip and expand at the most inconvenient moment. The simple appliance shown in *Fig.* 164 entirely obviates this difficulty. The holder keeps the pessary firmly gripped until it is fully introduced, when it can be dislodged from the metal appliance by gentle pressure from below. It is unquestionably an appliance to have, and only costs 2/3. The Holborn Surgical Instrument Co.

Fig. 164.

Phimosis Clamp and Scissors Combined.—The instrument illustrated (*Fig.* 165), consists of a pair of round-pointed scissors, to the under blade of which is attached a metal plate, shaped like one-half of a circumcision clamp after the Jewish pattern, the blade of the scissors forming the other half. When the scissors are opened, the prepuce is drawn through the slot formed in the manner described, and removed by the closing of the blades.

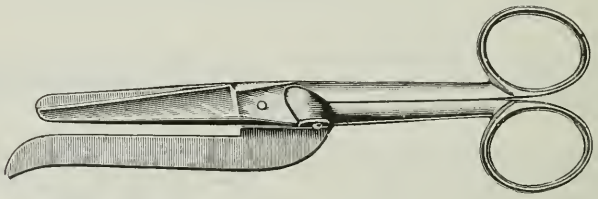


Fig. 165.

This instrument should prove useful to practitioners who may be called on to perform the operation of circumcision without assistance. The instrument is made with detachable aseptic joint. Price 6/6 each. Messrs. R. Sumner & Co., Lord Street, Liverpool.

Phosphor Bronze Wire.—This is recommended by Murphy, of Chicago, for fractures, snares, or any part of the body where wire is required for suturing. It is made in various sizes and sold at 2/3 per lb. by Messrs. Allen & Hanburys, Wigmore Street, W.

Radium Treatment.—The apparatus here illustrated (*Fig.* 166) has been designed for the purpose of conveniently preparing radio-active water for use in the patient's home. It is a fact fully recognized by scientists that water containing radium emanation is not transportable owing to the much higher co-efficient of solubility of the emanation in air than in water, and also to the fact that even if undisturbed, for all practical purposes the whole of the emanation will have disintegrated within a week. A very wasteful and unscientific method is to send water having a much higher content of emanation than is required in order to allow for losses; by this method it is obviously impossible to regulate the dosage.

Fig. 166.

With the apparatus illustrated "activators" containing radium can be supplied which will give a definite dosage of emanation per day, this method being free from all the foregoing objections. In the actual construction of the bottle, it will be noted that a separate reservoir is fitted which contains approximately one pint of water, and this constitutes the dosage per day, the water being drawn from the lower part of the apparatus.

Apparatus are manufactured giving the following dosage:—

1,000	maché units	per day	= 1	electrostatic	unit.
2,500	,,	,,	= 2·5	,,	,,
5,000	,,	,,	= 5	,,	,,
10,000	,,	,,	= 10	,,	,,

Another method of using radium is in the form of radio-active earth. This is prepared from the crushed pitchblend from which the major portion of the uranium has been extracted. It is mixed with boiling water and used as a local application. It is mixed with the water of the bath, or with water to be used for injections, and it is employed also as a local application for ionization, the positive pole being placed over a layer of moistened earth about ¼ in. in thickness, and the negative pole upon the spine. A 4-lb. tin of the earth costs 13/-. Radium Limited, 93, Mortimer Street, W., supply this, and will give all particulars and literature upon the subject.

Radium Emanations.—Having regard to the interest taken at the present moment in the study of Radium emanations, we illustrate here the "Schmidt Electrometer" (*Fig.* 167), which enables the emanation to be detected and quantitatively expressed. The apparatus consists of two parts: The electrometer proper containing the leaf carrier, supported by an amber insulating piece. The ionization chamber. which is placed on top, and into which projects the inner or discharging electrode. The case of the ionization chamber is a brass cylinder screwed top and bottom, and closed by a cover fitted with two stopcocks and a spirit level. In order to render this case air-tight, grooves are provided at both ends into which a cement may be run (made from equal parts of colophony and beeswax).

Accurate reading of the position of the leaf is facilitated by a quartz filament attached thereto, and is accomplished by the aid of a microscope, the point of intersection of the filament with a horizontal line running through an ocular scale being observed. The charging of the inner electrode is accomplished by means of a suitable switch having an amber insulated contact passing through the front of the electrometer case, thus the leaf when charged is entirely isolated while a test is in progress.

With this instrument various tests may be made to determine the activity of solids, liquids or gases, also for measuring very small quantities of radium

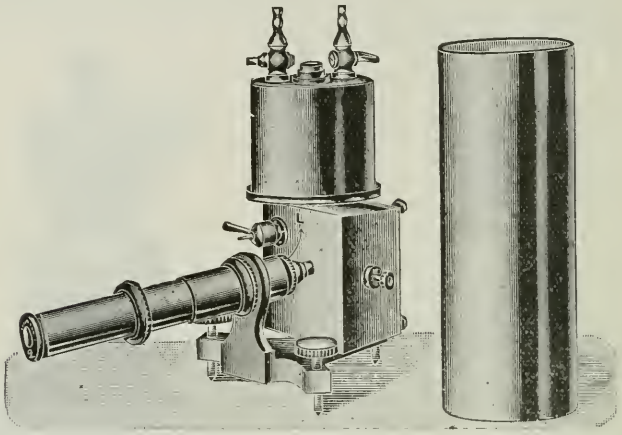


Fig. 167.

with the aid of the emanation method. It is eminently suitable for determining the amount of emanation in the waters and gases of natural springs believed to be radio-active. Radium Limited, 93, Mortimer Street, W.

Rubber Pads (for use with Back Splints.)—It is well known that the great fault of the ordinary " back splint and foot-piece " is the persistent tendency of the heel to ride up, leaving the foot in an equinus position. To prevent this, many surgeons bandage the heel to the angle of the splint, and then tuck wool or tow beneath the toes. This, however, is generally unsatisfactory, for the pads become either lumpy or displaced. To remedy this, Mr. Todd, of Guy's Hospital, has introduced some rectangular wedges of hard rubber (*Fig.* 168), one of which is placed under the toes, wrapped up in a layer of cotton-wool. These pads are found to remain in place, and to be quite comfortable ; they are made in six sizes, of which the larger may be used for maintaining a varus or valgus position of the foot after a fracture, or an orthopædic operation. The wedges have been used in this way at the Royal National Orthopædic Hospital, and at Guy's, and have proved very satisfactory. The Holborn Surgical Instrument Co.

Fig. 168.

Safety Razor Outfit.—This consists of a bottle of Brytstele and a suitable vessel for holding the safety razor. After shaving, instead of taking the razor to pieces and drying each part, it is simply rinsed and put into the solution. When required for use it is always ready. We have tested this apparatus daily during the past twelve months. The saving of time and trouble has been a real boon to us, and the claim put forward that the blades remain sharp for twice the usual time we can more than endorse. It is the moisture left on the edge of the blade after drying which blunts a razor more than the shaving. Another important point is that the blade is always aseptic. The cost of the whole apparatus is only 1/3. We would not be without it if it cost ten times as much. Mr. W. J. Bennett, 26, Alexandra Road, Kingston-on-Thames, is the manufacturer.

Salvarsan Injections.—We illustrate in *Fig.* 169 the method worked out by Messrs. Philip Harris & Co., of Birmingham, for injections of salvarsan by the intravenous method. It is efficient, and can be supplied at a cost of 15/-.

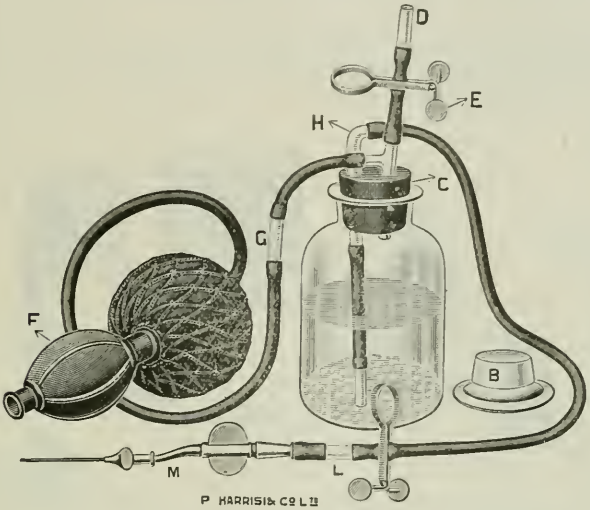


Fig. 169.

Sclerectome.—This instrument, suggested by Mr. Percy Bardsley, M.B., consists of two parts (*Fig.* 170): (*a*) An angled, narrow-bladed keratome, with a hole drilled through the blade; (*b*) A punch attached to the handle of the keratome (worked with a lever and ratchet), which descends into the hole. A conjunctival flap is turned down to the cornea and drawn over it in the usual way. The keratome blade is inserted through the sclera into the

Fig. 170.

anterior chamber and pushed forward till the piece of sclera in front of the cut comes under the punch. The lever is then pressed by the first finger, and the punch removes a circular piece of sclera which remains in the hole of the keratome blade, and is thus withdrawn with the blade. A peripheral iridectomy can now be done, if desired, through the keratome opening. The conjunctival flap is then replaced. Makers, Messrs. Down Bros. Ltd., London.

Sphygmo-oscillometer.—This instrument (*Fig.* 171) is designed to give measurement of blood-pressure and the arterial pulsation, which is transmitted direct from the armlet to the registering needle. It consists of a rigid and air-tight metal box, which contains an aneroid chamber; the chamber and armlet are in direct communication with each other. The armlet is wrapped evenly round the right arm of the patient, over the biceps

next to the skin (with children the bag can be placed round the thigh). The arm and hand of the patient must rest upon a table at the level of the heart, and the finger of the observer's left hand be kept upon the pulse. Loosen the screw valve near the ball, and see that the indicating needle is at zero; if this is not the case, adjust by revolving the dial. Screw the valve outlet near ball tightly home. The pressure in the bag is slowly raised by squeezing the ball, until the pulse can be no longer felt. Loosen the screw valve near the ball, allowing the air to escape slowly; at the same time the needle must be watched, and if no deflection occurs, it means that the atmospheric pressure

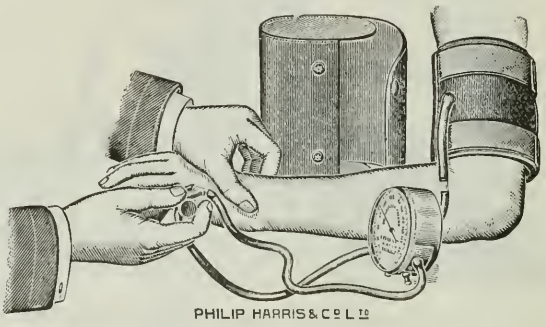


Fig. 171.

is too high and must still be lowered. The maximal or systolic pressure is that at which the needle first shows definitely increasing oscillations. To find the diastolic tension the atmospheric pressure must be lowered gradually by opening the valve near ball until the point of maximum oscillation is reached; this marks the diastolic pressure. The advantages claimed for the "Harris" sphygmo-oscillometer are elimination of the personal equation and definition of the diastolic pressure. It is manufactured by Messrs. Philip Harris & Co., of Birmingham, and costs £3 3s.

Splints.—The Surgical Manufacturing Co., of 85, Mortimer Street, W., have produced a handy case (*Fig.* 172), containing all the splints likely to be neces-

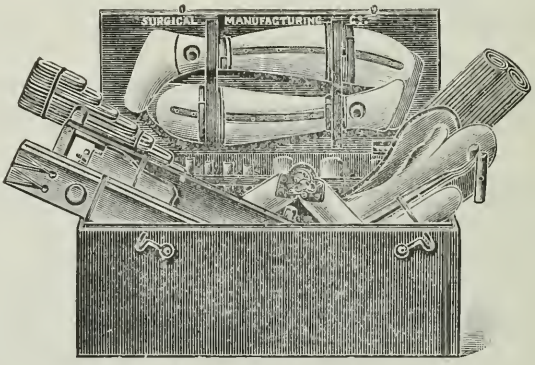


Fig. 172.

sary for any ordinary case of fracture. Such a case is not only valuable to the surgeon, but would be usefully kept at public works, railway stations, etc.

to meet emergencies. We remember a railway accident within a hundred yards of the station of a very large town, the junction of two great railways, and yet no splints for the fractures were available, and the writer had to fall back upon time-tables and string! The case is well designed to meet every emergency

Spray ("**The Angulique**").—This is the latest spray apparatus brought out by Messrs. C. J. Hewlett & Son, Ltd., 35-42, Charlotte Street, E.C. (*Fig.* 173). The advantage claimed is that the spray can be directed upon one spot of the pharynx. It appears to us a very practical instrument, and can be purchased for 5/6.

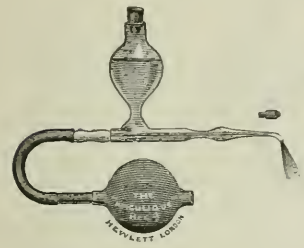


Fig. 173.

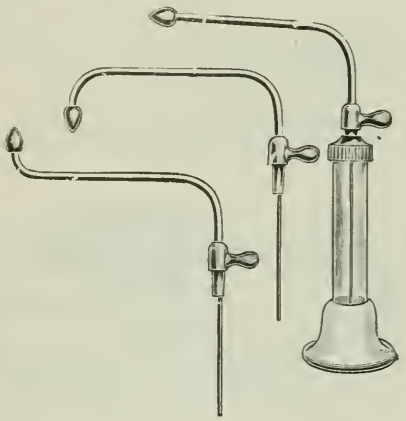


Fig. 174.

Spray Tubes.—We illustrate (*Fig.* 174) the "Grevillite" set of nickel-plated metal spray tubes for the larynx, pharynx, and posterior nares, with plug mounts, glass flask on enamelled white wood stand, complete with metal pump, per set, 6/6. The Medical Supply Association, Gray's Inn Road, W.C.

Sputum Flasks.—Messrs. Philip Harris & Co., of Birmingham, have introduced a sputum flask (*Fig.* 175), which consists of a metal holder to take card refills, which are destroyed after use. These refills costs 4/- per hundred.

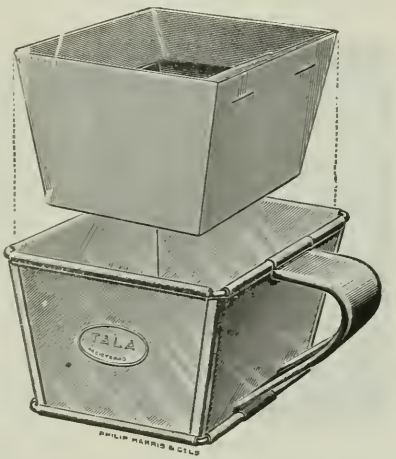


Fig. 175.

Sterilized Dressings.—We have received from the Surgical Manufacturing Co., 85, Mortimer Street, W., a drum containing sterilized dressings ready for operation. We tested this drum by handing it to a surgeon for an important abdominal operation. As the patient recovered without any rise of temperature we consider it the best evidence that the sterilization was perfectly performed. The method of using drums of sterilized dressings for operations is so generally adopted by surgeons that our readers will be glad to know of a reliable firm.

Stomach or Intestinal Clamp.—This is an extremely heavy instrument, designed by Roux, of Lausanne, which crushes that part of the stomach or intestine to which it is applied into a gelatinous mass (*Fig.* 176). It is made by Messrs. Allen & Hanburys, Wigmore Street, W.

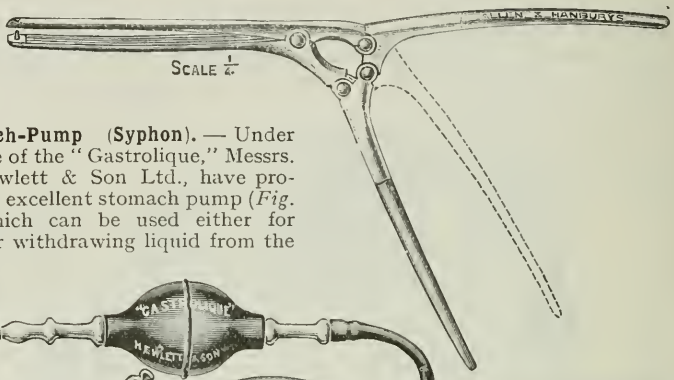


Fig. 176.

Stomach-Pump (Syphon). — Under the name of the "Gastrolique," Messrs. C. J. Hewlett & Son Ltd., have produced an excellent stomach pump (*Fig.* 177), which can be used either for lavage or withdrawing liquid from the stomach. It is made of rubber and glass, and has an inspection chamber which is convenient for preventing air being injected into the stomach. It costs 10/6.

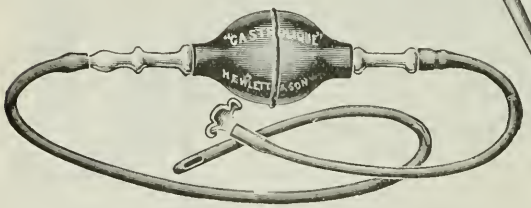


Fig. 177.

Stove (The "Altheat.")—This invention supplies a well-diffused heat to the largest dwelling room, with a consumption of 10 cub. ft. of gas per hour. This means that the cost of heating for 10 hours a day will be about 2½d.

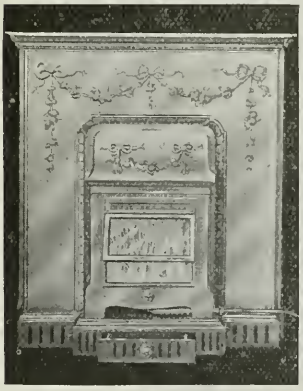


Fig. 178.

This result is brought about by first utilising all the *radiant* heat of combustion, while the fumes, which represent about 60 per cent of the heat of an ordinary fire, have all their heat abstracted and utilised before they are discharged. The cooled waste gases are expelled under considerable pressure, and readily ascend a chimney or flue-pipe. This fact has been made use of for the ventilation of hospitals. By connecting the stove to the outlet ventilators, the waste gases cause a strong current of air to pass through them. The wards are thus warmed in a cheerful, efficient, and most economical manner, and perfect ventilation is secured.

A series of natural physical laws have been brought into use to accomplish these results. We have not space to describe them; but the final result is that gas becomes, for the first time, the cheapest of fuels and all its disadvantages are removed because *all* the products of combustion are consumed and utilised. (*Fig.* 178). The Altheat Co. Ltd., 62, Oxford St., W., will supply a descriptive pamphlet.

Stricture Guide.—Mr. J. S. Thompson, F.R.C.S., has invented a new stricture guide (*Fig.* 179), which consists of a short hollow tube, size No. 12 catheter, length 8 inches, made in metal and gum-elastic. The internal diameter is less than that of a No. 12 catheter, owing to the greater thickness of the wall of the tube, as the lumen is only intended to receive small catheters and bougies. The opening at one end, *A*, is concentric, that at the other end, *B*, being eccentric, even more so than represented in the diagram, so that the outer and inner surfaces at one part of the circumference run into one another. This instrument will often be found valuable in difficult cases of narrow urethral strictures where other procedures fail. The guide is passed into the urethra and shouldered down on to the face of the stricture. A small soft catheter, or bougie, is then inserted into the lumen of the guide.

Fig. 179.

If the opening of the stricture be concentric and the appropriate end, *A*, of the guide face it, the catheter or bougie will pass at once through the opening of the stricture or after a little manipulation. If this be unsuccessful, however, the guide is removed from the urethra, reversed and reinserted, so that the eccentric opening *B* now faces the stricture. The catheter or bougie is again inserted and manipulated in the usual way, whilst the guide is gradually rotated till its and the stricture's openings are facing, when they can be caused to pass through and onwards. After successful passage the guide is removed from the urethra, the catheter or bougie meanwhile and after, being retained *in situ*. This device is most useful in difficult cases, as will be realized after trial. We consider this a most useful and practical invention. It is made by the Holborn Surgical Instrument Co.

Suprapubic Apparatus (as designed by Dr. Going, Littlehampton).—The advantages claimed for this apparatus (*Fig.* 180) are that its triangular

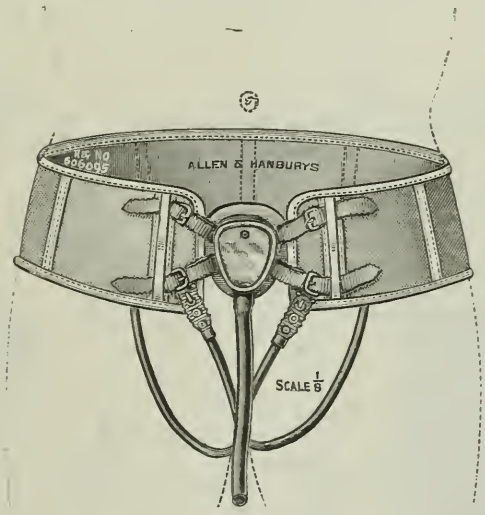


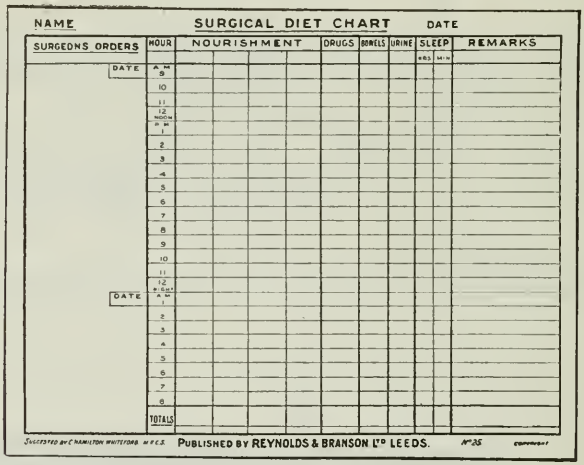
Fig. 180.

shape causes it to fit much more accurately to the patient when in a sitting position. The ordinary round apparatus previously invented and

used by Mr. Hamilton Irving makes it necessary for the patient to sit with the legs apart owing to the shape. Further, Dr. Going's apparatus has one opening at the most dependent portion, thus allowing every drop of urine to run away; but with Hamilton Irving's apparatus there is an opening at each side, so that there is always a puddle of urine between the openings. Various other improvements render Dr. Going's the best apparatus of this kind hitherto invented. Messrs. Allen & Hanburys Ltd.

Surgeons' and Practitioners' Bag.—With this pattern of bag the sterilizer is carried in the bottom, and there is also a special rack for bottles, fitted at the bottom. This arrangement leaves the inner part of the bag free for instruments, etc., and there is no danger of the bottles becoming broken. This bag is 16 inches long, and it can be supplied of cowhide or pigskin, as desired. Messrs. Allen & Hanburys, Wigmore Street, W.

Surgical Diet Chart.—Suggested by Mr C. Hamilton Whiteford, Plymouth. This chart is intended for use in conjunction with the combined temperature


NAME SURGICAL DIET CHART DATE

SURGEONS ORDERS	HOUR	NOURISHMENT				DRUGS	BOWELS	URINE	SLEEP		REMARKS
									HRS	MIN	
DATE	A.M. 9										
	10										
	11										
	12 NOON P.M.										
	1										
	2										
	3										
	4										
	5										
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DATE	12 NOON A.M.										
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	6										
	7										
	8										
	TOTALS										

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Fig. 181.

pulse and respiration chart of Mr. Mayo Robson. Redundant details have been eliminated. Spaces have been left for surgeons' orders and nurses' remarks. On a record of twenty-four hours, which includes portions of two days, there is apt to be doubt as to which day the record refers to. This has been obviated by leaving two spaces for dates at the left of the "Hour" column, under "Nourishment"; the sub-headings have been left blank, to be filled in as required, i.e., "Rectal Saline," "Milk," etc. All details have been printed in bold type, easily discernible in the shaded light of a sick-room (*Fig.* 181). Messrs. Reynolds & Branson, Leeds.

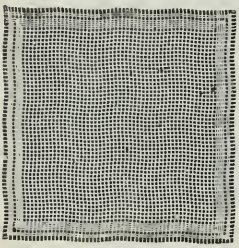

Fig. 182.

Surgical Pads.—*Fig.* 182 illustrates the "Tetra" surgical pads, which are prepared by the Surgical Manufacturing Co., 85, Mortimer St., W. They are made of a new material which is soft, aseptic, and absorbent. These pads are finding great favour with surgeons who have used them.

Test-tube Holder.—One of the greatest novelties of the year is a simple test-tube holder with stand. It can be supplied without spirit lamp at a cost of 9d., when by bringing the holder to a horizontal position it serves conveniently to hold it over the spirit lamp. It is also provided with a spirit lamp to each holder at a cost of 1/3. It is distinctly an improvement over the old test-tube, holders both for medical purposes and in the chemical laboratory, as it enables us to put our test-tube over a piece of paper on which we have noted its contents. This can be obtained of the Medical Supply Association, 167–173, Gray's Inn Road, W.C.

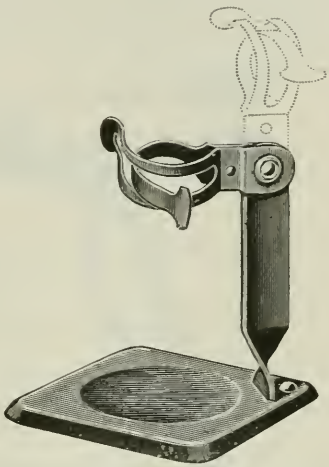

Fig. 183.

Messrs. R. Sumner & Co. also produce a test-tube holder (*Fig.* 183) of a similar character, which can be used either as a stand, or to hold the tube in the spirit flame. The cost is 9d.

Tongue Depressors.—The latest form of tongue depressor has much to recommend it. It consists of a flat blade of wood supported by a metal handle. You can use it one hundred times with a fresh blade for every patient, and the cost is only 2/–. It removes the necessity of rendering the tongue depressor aseptic each time it is used, and the wooden blade gives a grip of the tongue far superior to metal. In out-patient work this form of tongue depressor has special advantages, and if economy is a necessity, there is no reason why the blades which have been used should not be boiled and then used again. But they are so cheap that it is hardly worth while. These can be obtained from Messrs. Ferris & Co., Bristol.

The illustrations (*Figs.* 184 and 185) show the mechanism of Herschell's tongue depressor. The upper wire frame is placed on the tongue and the lower one under the chin, and fixed with a set-screw. It is made in two sizes, for children and adults, price 5/6. The Medical Supply Association.

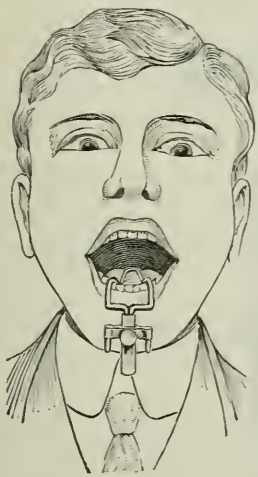

Fig. 184.

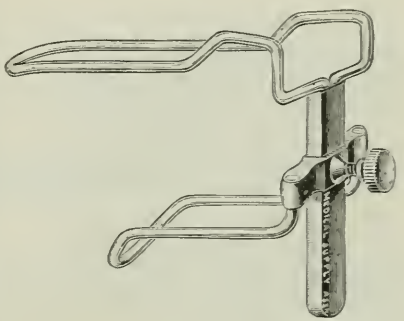

Fig. 185.

Tongue Forceps.—*Fig.* 186 shows a new type of tongue forceps, the chief advantage claimed being the insertion of rubber discs to hold the tongue, in place of the ordinary steel jaws. These discs grip firmly and cause no injury. The entire instrument can be sterilized by boiling or other means with the greatest ease. The rubber ends can be renewed in a few seconds whenever

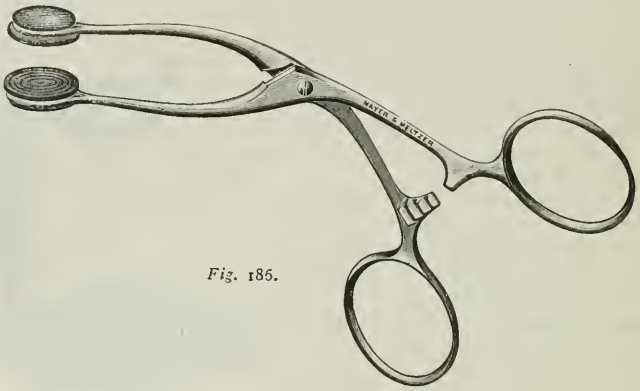

Fig. 186.

required. For the convenience of the anæsthetist the handles are placed at an angle, and can in no way interfere with the operator. The sore tongue sometimes complained of by patients after the ordinary type of forceps has been used is obviated by this instrument. It is designed by Mr. T. Conrad Reeves, and is made by Messrs. Mayer & Meltzer. Price 12/6.

Fig. 187.

Tonsil Guillotines, etc.—Messrs. Ferris & Co., of Bristol, supply Mackenzie's pattern with detachable blade and handle adjustable at three angles. This is a very popular instrument with many practitioners.

We illustrate a guillotine (*Fig.* 187) supplied by Messrs. Philip Harris & Co., of Birmingham. It will be seen that it is easily taken apart for sterilizing.

The guillotine here shown (*Fig.* 188) has been designed by Dr. Thos. Guthrie, in order to facilitate complete removal of the tonsils by the method first described by Dr. Greenfield Sluder, of St. Louis. The chief features of this method are the following: (1) The upper or distal surface of the ring of the guillotine is applied over the tonsil, instead of the lower or proximal surface of the ring, as in the ordinary method; (2) The tonsil is drawn by the ring forcibly upward and forward until it lies over a swelling on the lower jaw corresponding to the socket of the last molar tooth and known as the "eminentia alveolaris." This prominence is thus made use of to press the lower portion of the tonsil through the ring; (3) The upper pole of the tonsil is made to enter the ring by pressure of the index finger of the operator's free hand on the anterior faucial pillar and outer part of the soft palate. By this method it is possible with practice to remove the whole tonsil with its capsule, in all but very exceptional cases. It is manufactured by Messrs. Mayer & Meltzer, 71, Great Portland Street, W., and costs 37/6.

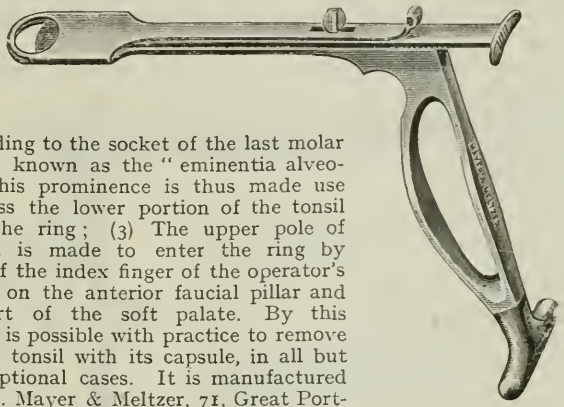

Fig. 188.

The angular double-action guillotine (*Fig.* 189) is an improvement on the ordinary French model. The blades approximate more closely, and therefore make a cleaner cut, both sections of the ring having a cutting edge. The shaft of the guillotine is angular near the end, thus giving a clear vision, and allowing the fork to pass through the shaft, rendering it more stable. Personally we have a decided preference for this form of guillotine, which transfixes the tonsil and draws it forward as the blade reaches it. Messrs. Reynolds & Branson, Leeds.

Fig. 189.

Tonsil Enucleator.—Mr. Stuart-Low claims that after considerable experiment with various patterns he has come to the conclusion that the simple instrument shown by the accompanying illustration (*Fig.* 190) is the best. The more slightly curved end of the instrument is first made use of, its purpose being to draw back or perforate the thin anterior pillar of the palate, which is usually stretched over, and often firmly attached to, the enlarged or embedded tonsil. This blade is then swept round the upper pole of the tonsil and down its inner side, the posterior pillar being thus set free. Afterwards the enucleator is reversed, the more curved end being employed to dissect the attached mass, and finally enucleating the remaining lower portion of the tonsil. The

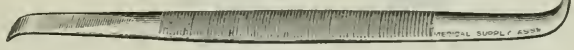

Fig. 190.

dissecting ends of the instrument are not very sharp, and therefore not dangerous to use, while the two curves are just sufficient in amplitude to effectively get round the parts that it is the purpose of the instrument to dissever. The body of the enucleator is roughened in order that a firm grip may be obtained, and it is just long enough to reach the recesses of the tonsillar fossa easily. This is made by the Medical Supply Association. Price 5/-.

Tonsillectome.—This instrument (*Fig.* 191) has been designed by Dr. O'Malley as a modification of the instrument designed by Ballenge of Chicago. Its essential features are: (1) A thin ring (slightly more than $\frac{1}{16}$ inch on section). The outer or convex aspect of the ring is complete, as there is no slot, the upper rim being brazed on to the lower. (2) On the inner aspect of the ring a shallow slot recess is left, which when the instrument is ready for use is filled with lead. (3) The margin of the upper rim which surrounds the opening is square and not bevelled, as in the usual type of tonsillotome. (4) The opening is small and square posteriorly. The size which is of the most general use gives the following measurements: (*a*) Transverse diameter $\frac{11}{16}$ inch, (*b*) Antero-posterior diameter $\frac{10}{16}$ inch; a second size needed for a small percentage of cases is $\frac{13}{16} \times \frac{13}{16}$ inch. (5) The shaft and blade are $6\frac{1}{2}$ inches long. The shaft is stout and strong and the blade blunt. (6) The blade is driven home by a lever in the handle and not by the thumb.

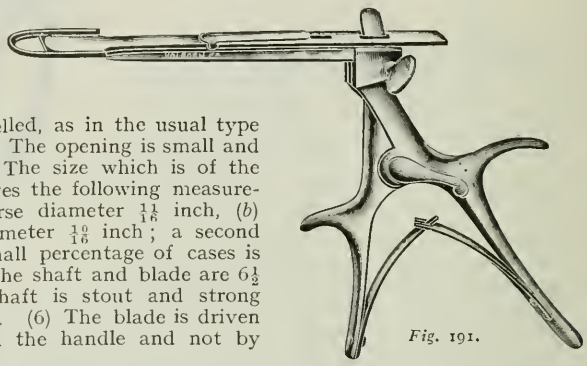

Fig. 191.

The solid ring gives strength, without bulk, and being thin is easily slipped deep to the tonsil. The square margin is capable of raising a fold on a flat skin or mucous surface, and this prevents slipping if a flat tonsil is being carried forwards.

Owing to the beaded face and absence of slot, the blunt blade cuts only the mucous membrane surrounding the free aspect of the tonsil, and the capsule is dissected off its bed. The blood-vessels of the tonsils are therefore first crushed and then torn across, giving a minimum of hæmorrhage. For the same reason there is less risk of cutting or button-holing the pillars than if a slotted instrument is used, even with a dull blade. This is manufactured by the Holborn Surgical Instrument Co., 26, Thavies Inn, E.C.

Tourniquet for Intravenous Injections.—The pneumatic tourniquet here illustrated has been designed by R. H. Jocelyn Swan, F.R.C.S., for use in

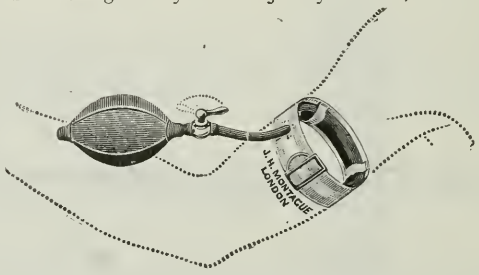

Fig. 192.

giving intravenous injections. He found on occasion, that having passed a cannula needle into a vein, the movement during the release of the ordinary

rubber tourniquet resulted in the needle piercing the wall of the vein or even leaving it. The appliance consists of a tube of firm rubber connected by a smaller tube and an inflating ball (*Fig.* 192). In this smaller tube is placed a three-way valve tap, so that the pneumatic tube can be inflated, kept filled, or deflated by a very small movement of the handle of the tap. The pneumatic tube is loosely attached to a firm band of webbing fitted with a buckle to fix on the upper arm. In use the webbing band covering the tubes is fixed loosely in position, and the latter inflated by pressing the ball. After the vein is punctured, the tube is deflated, but remains in position until the injection is finished, in this way obviating any movement of the limb whilst the needle is *in situ*. It is made by Mr. J. H. Montague, 69, New Bond Street, W.

Tooth Forceps (Miniature).—This is a most useful little instrument for removal of children's teeth. It can be concealed in the hand, as shown in illustration (*Fig.* 193); the little patient is therefore not alarmed by the

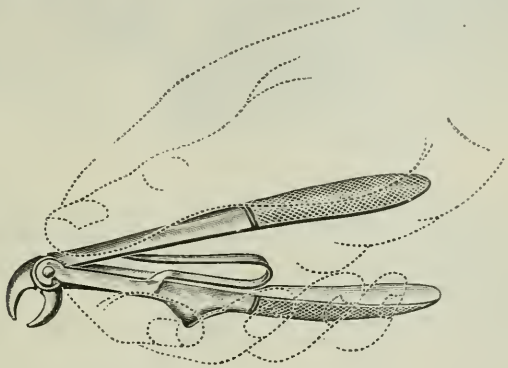

Fig. 193.

appearance of the usual dental forceps. It is constructed with a spring, by means of which the jaws of the instrument are easily controlled, and is made for incisors, upper and lower stumps, lower molars, and bicuspids. Price 6/6 each. Messrs. R. Sumner & Co., Lord Street, Liverpool.

Trocar (Brain).—This is a very useful instrument for use on watery cysts, etc., in different parts of the brain. It is quite blunt, so that it may be care-

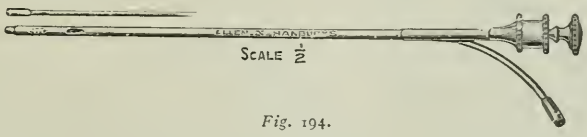

Fig. 194.

fully introduced without doing any damage to the parts of the brain, and when the cyst is reached the blunt obturator or trocar is withdrawn, leaving the tube for the cyst to drain through. (*Fig.* 194.) It is manufactured by Messrs. Allen & Hanburys Ltd.

Tuberculin Outfit.—The Medical Supply Association have fitted up a leather case with sterilizer, syringe, bottles, and everything likely to be required for the administration of tuberculin. It is practicable and portable and costs 70/-.

Messrs. R. Sumner & Co., of Liverpool, also put up a tuberculin outfit in a neat wooden box (*Fig.* 195). It contains, in addition to all the appliances likely to be required for injection, a Caird's syringe with needles immersed in

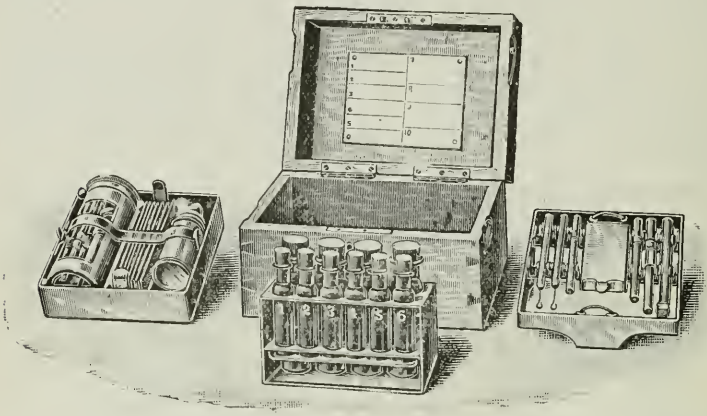

Fig. 195.

alcohol, so that the whole injecting apparatus is protected from the air. We noticed this syringe in our last issue. The case is very complete and well designed. It is supplied with a cover and strap, which makes it quite portable.

Tuberculin Tests.—The Medical Supply Association send us samples of glass-covered pipettes, 1 c.c. graduated in $\frac{1}{10}$ths, with test for tuberculin; glass pipette with glass piston, 1 c.c. graduated in $\frac{1}{10}$ths. These are the latest form of pipettes used in tuberculin treatment.

Tuberculosis Patients' Daily Register.—This device, published by Messrs. Parke, Davis & Co. at the suggestion of Dr. H. de C. Woodcock, is indeed a sign of the times. In order to compass the cure of tuberculosis, there is no doubt as to the necessity of securing the patient's hearty and intelligent co-operation, and it is on this principle that the chart under consideration is compiled. The first two pages are for notes by the doctor. Each pair after these provides space for a week's notes by the patient on his symptoms, with a small space at the foot for the doctor's remarks. We think the headings for the patient's notes are a little too detailed and intimate; it is questionable whether it is well to encourage him to think quite so much about his own symptoms. With this reservation we find the idea of the chart an excellent one. The pages are bound together in a neat volume, for which an envelope is provided that is waterproof and readily cleansed.

Umbilical Tape, Sterilized (Parke, Davis & Co.).—The quest for perfect asepsis has been undoubtedly forwarded by the introduction of the hermetically-sealed ampulla. It is this device that has been applied in the present instance. The box sent us contains six tubes, each holding two tapes, which the obstetrician may use with confidence. In view of the terrible possibilities of umbilical sepsis, this is no small gain. There is a narrow neck in each tube at which it may readily be broken; of course the operator must look after his fingers in doing so.

Urethral Dilators (Kollmann's).—These instruments have been improved by Professor Kollmann, and are used very largely on the Continent. They have also been taken up by Mr. Canny Ryall at the All Saints' Hospital for

Genito-urinary Diseases, where they are used daily with very great success. The chief improvement in the new model is, that owing to the shape of the

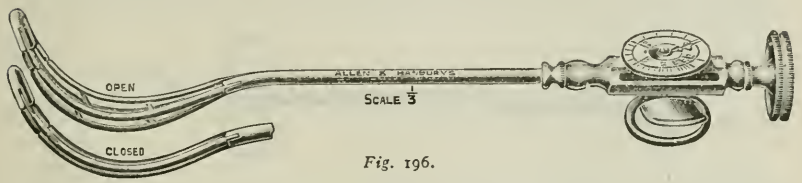

Fig. 196.

blades, there is no danger of injury to the mucous membrane, and therefore rubber sheaths are no longer necessary. (*Fig.* 196.) Messrs. Allen & Hanburys Ltd.

Urethral Irrigator (Bayly's).—This simple appliance (*Fig.* 197) consists of a glass container with a metal lid connected by four feet of rubber tubing with an apparatus comprising a glass shield, glass cannula, ground-glass nozzles, and rubber cork. It is suspended by a cord passing over a pulley fixed in any convenient elevated position, and so can be adjusted to any height required. We may advise those using this apparatus that the height actually needed is very little above the site of injection, as otherwise the urethra would be subjected to hydraulic pressure. It is designed by Dr. Hugh W. Bayley, and made by the Holborn Surgical Instrument Co.

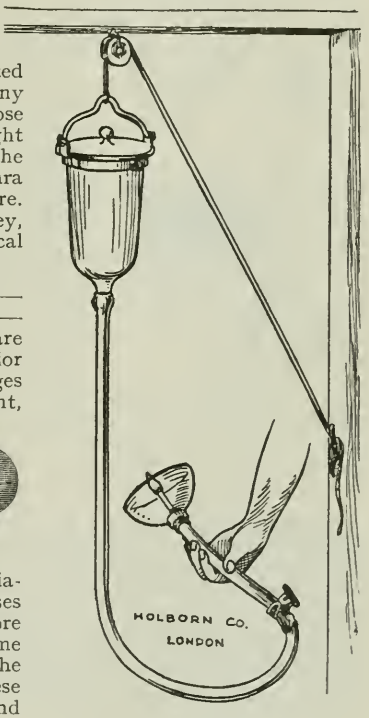

Fig. 197.

Urethral Syringes (Canny Ryall's).—Sterilizable, and made in three sizes—1, 2, and 4 drs. These syringes are employed in the treatment of the anterior urethral canal, the chief advantages claimed being that the whole instrument,

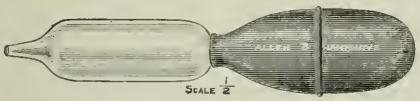

Fig. 198.

including the elliptically-shaped india-rubber ball, may be boiled for purposes of sterilization, and that it is therefore a very safe, useful, and at the same time inexpensive instrument for the patients' own use. (*Fig.* 198.) These are manufactured by Messrs. Allen and Hanburys Ltd.

Uterine Bougie Introducer.—This instrument (*Fig.* 199) has been designed by Mr. C. Willett Cunnington, in order to facilitate the introduction of medicated bougies into the cervix of the uterus. The metal introducer is tubular, with a flexible " ramrod " running through it. To use it, the " ramrod " is slightly withdrawn and a bougie inserted in the " muzzle." The instrument is then introduced into the vagina until the point is against the external os.

The " ramrod " is then pushed home firmly, so that the bougie is projected into the cervical canal. To prevent its slipping out, a cotton-wool tampon is packed against the cervix. It is not necessary for the patient to remain in

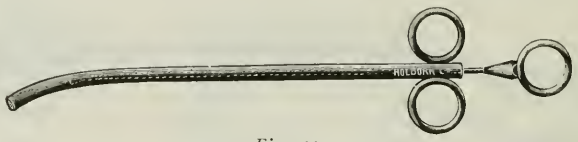

Fig. 199.

bed afterwards. The instrument is 8 inches long, with finger rings for convenience in holding. It is nickel-plated. The Holborn Surgical Instrument Co

" Vaparole " Ammonium Chloride Inhaler: Nasal Attachment.—The special feature of this attachment is that instead of carrying twin bulbs to go inside the nares, an expanded orifice with flanged edges is used. It is made of glass, with a rubber plug of such a size that it fits on the mouthpiece of the ammonium chloride inhaler made by the same firm (Messrs. Burroughs Wellcome & Co.). Remaining entirely outside the nares, it is easier to keep clean than the more usual type of nasal fitment.

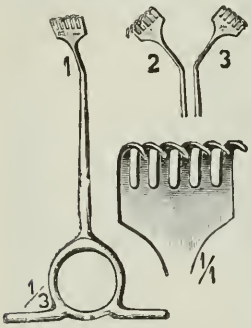

Fig. 200.

Wound Retractor.—We illustrate here (*Fig.* 200) a wound retractor for mastoid or other operations. It is made with four or six prongs, straight, curved right or left. They are excellently made, and well adapted for their purpose, costing 2/- or 3/- each. The Holborn Surgical Instrument Co.

Wyandotte Cleanser.—This is produced as a sanitary cleanser in bags of 3½ lb. at a cost of 1/-. We have tried it, and find it removes dust and grease in a remarkable manner, and is a really useful addition to the house or the hospital. It is actually cheaper in use than soap or soda, and is far more efficient. It is supplied by the Medical Supply Association, 167-173, Gray's Inn Road, W.C.

PROGRESS OF PHARMACY, DIETETICS, &c.

Allantoin.—Last year we had occasion to comment favourably on this solution of comfrey, at that time beginning to attract attention as a stimulant of epithelialization when applied to ulcers and granulating surfaces. Since that time its value has received wider recognition. Messrs. Sumner & Co., of Liverpool, who issued it on the recommendation of Dr. Charles J. MacAlister, call attention to the fact that owing to hydrolysis the solution becomes inert, and should not therefore be used after one month from date of issue. The same firm have sent us a specimen of their *Mist. Allantoin Co.*, which is designed for internal use in cases of gastric ulcer; here the allantoin is combined with bismuth.

" Apyrogen " Distilled Water is supplied by Messrs. Allen & Hanburys Ltd. in suitable phials for use in the making of intravenous injections. It is guaranteed free from " water-toxin," which has proved so great an obstacle to the safe employment of salvarsan for intravenous injection. This firm undertakes to make fresh " Apyrogen " solutions of salvarsan for immediate use, if twelve hours' notice be given. We would suggest that more explicit directions for use of the phial may be needed by the weaker brethren.

Argentide (Parke Davis & Co.) is a concentrated solution of silver iodide, each fluid ounce containing 100 grains of the salt. The manufacturers claim stability and non-toxicity for their preparation, with the additional advantage that it does not stain. Ten minims, added to 4 ounces of water, produce a " solution " of 1 in 200, the silver salt appearing in finely-divided suspension. It can then be used as a lotion for use in cystitis, gonorrhœa, etc.

Aspirin, Soluble.—Aspirin is so well established in medical practice that this preparation, overcoming as it does the insolubility of the drug, should meet with wide acceptance. It is manufactured by the Bayer Co.

Asurol (Bayer Co., St. Dunstan's Hill, E.C.) is a soluble mercury salt sent out in ampullæ, containing 2·2 c.c. of a 5 per cent solution. It has been highly recommended by competent authorities in the treatment of syphilis.

Azodolen Ointment contains a combination of pellidol (*see below*) with iodolen, which in turn is a compound of iodol with albumin. The antiseptic properties of the latter are therefore added to the stimulant action of the pellidol. This product is placed on the British market by Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C.

Azoules.—In addition to those containing *Emetine Hydrochloride*, noticed below, Messrs. Allen & Hanburys Ltd., have forwarded us specimens of the following drugs, enclosed in azoules (hermetically sealed capsules) ready for hypodermic injection: *Choline*, which has been put forward as a remedy for cancer; *Fresh Kidney Tissue*, for use in destructive renal lesions, such as polycystic disease of the kidney; *Yohimbine Hydrochloride*, a " nerve stimulant," which is said to have an aphrodisiac effect.

Bile Salts and Cascarin.—These chocolate-covered tablets issued by Messrs. Parke, Davis & Co. contain one grain each of bile salts and of cascarin (the bitter laxative principle of cascara sagrada, a drug for which we are primarily indebted to this firm). The coating does not dissolve till the duodenum is reached, so that this tablet is specially designed for use where the biliary secretion appears to be deficient.

Bile Salts and Pancreatin.—This is a similar tablet to the above, supplied by the same firm, containing half a grain of bile salts and three grains of pancreatin. The bile salts are derived from fresh ox-gall in their normal proportions.

Bismuth Lozenges, Aromatic.—These very attractive and palatable lozenges are the product of Messrs. Sumner & Co., Liverpool. They contain small quantities of bismuth and magnesia (the usual drawback of such lozenges is that they do not contain enough bismuth), combined with a remarkably powerful charge of carminative drugs. We have found them very useful in the relief of flatulence.

Byno Cascada (Allen & Hanburys Ltd.) is one of this firm's excellent malt preparations, and embodies the active principles of cascara sagrada in a form which is not only palatable but also stimulating to the digestion.

" Café Vierge " is a remarkably successful coffee essence prepared by Messrs. Allen & Hanburys Ltd. By using it all waste is avoided, as it is only necessary to prepare exactly the quantity required, a single cup being as easily made as a larger quantity. It may be made entirely with milk. One or two teaspoonfuls are added to a cup of hot water and milk, or of milk only, with sugar to taste. We can recommend this as a breakfast beverage for patients suffering from gastric hyperacidity.

Calf Lymph (Dr. Chaumier's).—This brand of lymph, produced at the well-known Tours establishment is now obtainable in this country through Messrs. Roberts & Co., New Bond Street, W.

Carnopeptone (Messrs. Sumner & Co., Liverpool) is a beef extract and may be used for its stimulant and nutritive properties during acute illness and convalescence. Whether it is an alcoholic extract is not stated.

Codeonal is a powerful hypnotic, sold by Messrs. Knoll & Co., Harp Lane, E.C., in tablet form. Chemically it is a mixture of the diethylbarbiturates of codeine and soda. It has been very favourably reported on by the German profession, as appears from the notice in the " Dictionary of Materia Medica and Therapeutics " at the beginning of this volume.

Cystopurin is a combination of hexamethylenetetramine (better known as urotropin) with sodium acetate. It affords a reliable and ready means of administering urotropin in cases requiring a urinary antiseptic, and we have given it for this purpose with satisfactory results. The firm manufacturing it is Messrs. A. Wulfing & Co.

Deliciol is the name given by Messrs. C. J. Hewlett & Son to their preparations of paraffin, a substance which is being extensively prescribed, with favourable results, as an intestinal lubricant and antiseptic. The peculiar merit of these preparations lies in the careful flavouring, whereby an unpleasant drug is rendered palatable even for children.

Digestives Conc., Mistura.—This is a concentrated mixture containing pepsin, pancreatin, diastase, and other digestive ferments combined with carminatives. One part should be added to seven of water. It is a very palatable mixture, and may be used in various types of functional dyspepsia. Messrs. R. Sumner & Co. are the makers.

Digipuratum, prepared by Messrs. Knoll & Co., is sold in tablets and in solution ; in the latter form it may be used for hypodermic injection. It is a digitalis preparation, freed from all the deleterious bodies present in the leaves, and containing the glucosides in natural proportions. Various clinicians have reported favourably as to its constancy and reliability of action.

Emetine Hydrochloride, the alkaloid of ipecacuanha, is likely to come into considerable use, since Professor Leonard Rogers has reported so favourably as to its value in the treatment of amœbic dysentery (*see* " Amœbiasis " in this volume). Preparations are issued by Messrs. Parke, Davis & Co., Messrs. Burroughs Wellcome & Co., and Messrs. Allen & Hanburys Ltd. We have used this drug hypodermically, and also by the mouth, and find its irritant properties very slight. For hypodermic use we prefer the solutions sold by these firms in sealed ampullæ to solutions made from tablets.

Epinine Co., "Tabloid" (Burroughs Wellcome & Co.) contains epinine—a synthetic compound resembling adrenalin, to which we gave attention in our last issue—in combination with small doses of heroin hydrochloride, ipecacuanha, benzoic acid, and oil of gaultheria. It is therefore a useful preparation for congested and irritated throats, such as result from acute catarrh, over-use of the voice, dusty atmosphere, etc.

Ergamine.—Messrs. Burroughs Wellcome & Co. have forwarded us a sample of a new " Tabloid " hypodermic product, with the following information. Ergamine is a recently isolated active principle of ergot, with a marked action on the uterus. It is an organic base, β-iminazolylethylamine, derived from the hexone base histidine by the elimination of carbon dioxide. This change can be produced by certain putrefactive bacteria and chemical substances as well as by the ergot fungus. Ergamine can now also be produced synthetically, in a state of chemical purity. The most important pharmacological action of ergamine is as a stimulant of plain muscle, this action being particularly conspicuous in the case of the uterus, which responds to mere traces of this potent substance. In rodents ergamine produces a rise of blood-pressure, causing in the guinea-pig an asphyxiating constriction of the bronchioles. In carnivora and in the monkey (and probably therefore in man) it has a weaker action on the bronchioles, and causes a fall of blood-pressure due to general vasodilatation. Therapeutically, ergamine is indicated when prompt contraction of the uterus is desired, as in cases of post-partum hæmorrhage. It is introduced for clinical trial, and the dose suggested is 1 mgram, repeated with great caution.

Ergothe is a physiologically-tested preparation of ergot by Messrs. Reynolds and Branson, Leeds, in ampoules of 10 minims each, for hypodermic injection.

Euguform, sold by Messrs. Chas. Zimmermann & Co., is a condensation product of guaiacol and formaldehyde, derived from wood tar. It is a fine light powder, and is therefore recommended for use in the same way as iodoform, to which it is said to be superior.

Euresol, a mono-acetate of resorcin, is strongly recommended by various dermatologists of note in the treatment of seborrhœa and alopecia. Messrs. Knoll & Co. are selling it; also a preparation, "Euresol pro Capillis," which can be made up into an elegant hair-wash by the addition of spirit and water.

Formitrol.—We should like to remind the profession that Messrs. A. Wander Ltd. have issued a formalin lozenge for oral antisepsis *which is not advertised in the lay press*. Each lozenge is wrapped in silver foil, so that the formalin does not evaporate. Their flavour is pleasant.

Garlic, Compound Syrup of (Syrupus Allii Co.) has been made by Messrs. Sumner & Co., of Liverpool, to provide a means of administering the nauseous and offensive allyl sulphide to patients suffering with pulmonary infections, such as tuberculosis, chronic bronchitis, etc. Those who wish to test the efficacy of this drug, so highly praised by a few, cannot do better than use Messrs. Sumner's syrup.

Glycerinum Belladonnæ Pallidium (Messrs. Sumner & Co., Liverpool).—The virtues of this preparation are declared in its name. Even the casualty dresser knows only too well the messiness of the official glycerin of belladonna. This substitute, which is sold at the very reasonable figure of 3/4 per lb., should commend itself to all practitioners. It is a transparent green fluid, and contains just as much belladonna as the dirty official glycerin. Messrs. Sumner are to be congratulated on a real pharmaceutical triumph.

Guaiacolatis, Elixir.—The value of guaiacol is now undisputed, but it is not always easy to know how to prescribe it. Messrs. James Woolley, Sons & Co., of Manchester, have prepared this elixir in order to facilitate the administration of guaiacol. Each fluid drachm contains 4 gr. of potassium guaiacol-sulphonate. The dose is 1 to 3 dr. three times daily. It is a pleasant preparation, both in taste and appearance. Our experience is that guaiacol is a drug which needs to be pushed, and we suggest that it may be necessary to raise the doses above the 3-dr. maximum fixed by the manufacturers.

Hydrastinine Hydrochloride.—The Bayer Co. have issued a very attractive silver-coated tablet, containing 2½ gr. of this drug, for oral administration. It may be recommended to those who use hydrastis in obstetric and gynæcological practice. The tablet must be swallowed, not chewed.

Hyposols.—We noticed these appliances for clean hypodermic medication in our last issue. We felt some doubt as to whether the time and cost involved would not prevent the practitioner from making use of the "hyposol," at any rate in the injection of the alkaloids in common usage; and we still feel that it is only with certain substances that the "hyposol" method will be worth while. This year Messrs. Allen & Hanburys Ltd. have sent us "hyposols" containing *Salvarsan* (·1 gram in oily base) and *Mercurial Cream* (1 gr. of mercury) respectively, for intramuscular injection; and we cannot imagine a better method of administering these substances. The "hyposol" should be warmed to blood-heat at the time of injection. For the convenience of our readers who may not be familiar with the "hyposol," we may explain that the drug is contained within a hermetically-sealed tube with tapering ends, destined to be broken off and used to carry a hypodermic needle at one end and the rod of a syringe-piston at the other. The handle of the piston is included in the box, and the plunger of the piston is ready in position within the "hyposol." The glass tube therefore becomes the barrel of the syringe used to introduce the drug, which is thus guaranteed aseptic. A small file for getting the ends off is included in each outfit.

Iodine.—We had occasion to call attention in last year's ANNUAL to the desirability of putting up iodine for surgical use in such a form that it could be carried about in a bag without fear of catastrophe. Among the preparations which satisfy this desideratum none has impressed us more favourably than the set of tubes issued by Messrs. Parke, Davis & Co. There are ten tubes, with a file, in each box; each tube contains 5½ gr. of iodine, enough to make a 2·5 per cent solution when dissolved in half an ounce of rectified spirit.

"Jothion" Ointment, made by the Bayer Co., contains 10 per cent of jothion, equivalent to 8 per cent of iodine. It is non-staining, and has attained wide use as a means of applying iodine locally. It has one advantage over other non-staining iodine ointments, that its appearance is more attractive. It is translucent, pale yellow, and not too thick. Our personal knowledge of this preparation is all in its favour. It must not be applied over broken skin.

Kinazyme Tablets (G. W. Carnrick Co.) are prepared from extract of spleen, enterokinase and other enzymes and hormones of the duodenum, and trypsin and other enzymes of the pancreas. Each tablet contains ½ gr. calcium lactate. The dystrophy of tuberculosis is said to be favourably influenced by the exhibition of this combination.

Lactophosphene is the name given by Messrs. Sumner, of Liverpool, to a tonic food which we noticed last year. The manufacturers tell us that their sales have trebled, and we are not surprised. There are three points of recommendation, in addition to the intrinsic value of the product; it is pleasant to take, its composition is stated (glycerophosphates of sodium, calcium, and magnesium, in combination with pure milk proteid), and it is *not* advertised broadcast in lay journals. One proprietary preparation of this type secured a large sale for a time by preserving a mysterious attitude as to its composition, an effect enhanced by its nastiness, and (having first secured the support of the profession by unfair means) by indiscriminate and inaccurate advertisement. We are glad to know that this preparation is being driven out of the market by the more honest products of British firms.

Lactophosphene Chocolate Bonbons.—Truly Messrs. Sumner & Co., of Liverpool, are bent upon destroying the tradition as to the nastiness of medicine. They have put up their tonic nerve food (noticed above) in the form of a chocolate sweet which it is difficult to leave off taking. For children nothing of its kind could be better, though perhaps it lacks the moral tonic effect of less palatable remedies.

Lecithin, as we stated last year, is prepared in chocolate-coated tablets by Messrs. C. J. Hewlett & Son. The same firm have forwarded us two elixirs; one contains 1 gr. of ovolecithin in each fluid drachm, and the other ½ gr. of lecithin with a drachm of compound syrup of glycerophosphates. Their use is indicated in neurasthenia and all states of nervous depression.

Leukion is an excellent specimen of the non-staining iodine ointments which have appeared in the market during recent years. It is sent out in convenient form at a reasonable price. There are three ointments: one consisting of the iodine preparation alone, another in which it is combined with winter-green, and a third in which menthol is further added. These preparations are for use in chronic arthritic affections. The same firm (Messrs. Steele & Marsh, of Bath) also supply "*Tablets Leukion Compound*" containing guaiacum, sulphur, lithia, benzoates, and salicylates, for internal administration in similar cases.

Liquor Fluorescens Conc.—Messrs. Sumner & Co. have prepared this in response to requests from their customers, who must be very hard to please if they are not satisfied with it. One drachm, or less, added to eight ounces of fluid, gives an attractive fluorescent green appearance to the whole, as well as a pleasant citron flavour. It is therefore a useful addendum to mixtures. It is incompatible with acids.

Lithio-Laxine is an effervescing laxative saline containing lithia. The dose is one teaspoonful in a tumbler of water before meals. It is sold by Messrs. Steele & Marsh, Bath.

Lotogens (Messrs. Reynolds & Branson, Leeds).—As the manufacturers remark, it is not always advisable to use a fatty basis in applying medicaments to the skin. For cases where the ordinary unguent preparations are for this reason contraindicated, they have prepared a series of " lotogens," in which such substances as oxide of zinc, resorcin, and so on, are dissolved in a rapidly evaporating medium. The series includes lotogen bismuth subgallat. co., plumbi carb., sulph. evaporans, zinci co., zinci co. c calamin., zinci c. calamin., and zinci c. ichthyol co. The bottle must be well shaken before the lotogen is applied.

Luminal is one more addition to the long list of new synthetic hypnotics made in Germany. It is first cousin to veronal, an ethyl group being replaced by a phenyl group. Luminal is the preparation given by the mouth, while luminal-sodium is used for rectal or hypodermic injection. A report of the literature appears in our Dictionary of Materia Medica at the beginning of this volume. It is sold by the Bayer Co.

Malt Extract (Crystalline) with Hæmoglobin.—Messrs. A. Wander Ltd. are to be congratulated on their pleasant compound of malt extract with organic iron. It is free from preservatives, and may be kept indefinitely so long as the bottle is carefully stoppered. It may be given as it is sold, in crystalline powder form, or dissolved in milk.

Milk Cocoa, Pancreatized.—Messrs. Allen & Hanburys Ltd. have once more added a valuable recruit to the army of invalid foods. It is a combination of cocoa with the " Allenburys diet," and since it contains milk, can be made in a minute by adding boiling water only—a valuable feature from the nurse's point of view. The flavour is delightful, and the practitioner may recommend it with a light heart to the most fractious of invalids.

Novatophan is the ethyl ester of methylated atophan, a remedy much used in Germany in the treatment of gout, to which we alluded last year in these pages. In clinical effect this new preparation is equivalent to the older one, while it has the advantage of freedom from the bitter taste of atophan. The pharmacological principle on which is based its employment in gout is that it increases the excretion of uric acid. It is sold in tablets, which disintegrate but do not dissolve in water, yielding a flaky mixture which must be swallowed, with plenty of water to follow. There are no unpleasant after-effects. Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C.

Omnopon.—By a printer's error we were made to say in our last issue that this useful product, sold by the Hoffman-La Roche Co., Idol Lane, E.C., " contains all the alkaloids of quinine ; " it should of course have been " all the alkaloids of opium." It is being employed for inducing narcosis preliminary to general anæsthesia.

Ovaraden Triferrin (Messrs. Knoll & Co., Harp Lane, E.C.) is a combination of triferrin, an organic iron compound, with ovaraden, an ovarian extract. By certain German clinicians it is recommended for use in the various climacteric troubles, also in the treatment of symptoms ascribed to other forms of ovarian inadequacy. The drug is sold in bottles of 45 tablets at 2/- per bottle.

Paroleine Spray Compound (Burroughs Wellcome & Co.).—This is for use in catarrhs of the upper respiratory tract, and contains menthol, " chlorbutol " and " eucalyptia." It is not clear from the information at our disposal what these two latter substances are, but we have no doubt they represent butylchloral and eucalyptus. If so, the formula is unexceptionable and likely to prove useful in those conditions for which it is designed.

Pasta Liermann (" Bolus Wound Paste ") is an interesting product sold in this country by Messrs. Chas. Zimmermann & Co., 9 and 10, St. Mary-at-Hill, E.C. It is composed of " bolus," a fine hygroscopic powder, which is

said to have a powerful action in drying up wounds and arresting the growth of germs; with alcohol and glycerin, and azodermin, a derivative of the substance amidoazotoluol, which is the active constituent of scarlet-red ointment. This compound has been used widely in Germany in the treatment of wounds and ulcers, and also in the achievement of surgical asepsis; and it deserves a thorough trial at the hands of British surgeons.

Pellidol Ointment (Messrs. A. & M. Zimmermann, 3, Lloyd's Avenue, E.C.). —Pellidol is a diacetyl derivative of amidoazotoluol, the active principle of scarlet red. This ointment therefore belongs to the large class of unguents containing scarlet red and its derivatives, which are of value as stimulants of epithelialization in the treatment of ulcers and other raw granulating surfaces. The special advantage of pellidol over scarlet red is its greater solubility in fats. The ointment sent to us certainly appears to be a solution and not merely a suspension. We trust it will receive careful trial and comparison with other products of the kind.

Pergenol, manufactured by the Saccharin Corporation Ltd., 10 Arthur Street West, E.C., should prove a very useful compound. It consists of hydrogen peroxide in powder or tablets, combined with boric acid, and ready for solution when required. An agreeable dentifrice of similar nature is issued by the same firm.

Peru Lenicet Salve is a bland ointment with a pleasant smell which contains balsam of Peru with aluminium acetate. It is a valuable remedy for chronic ulcer of the leg, as well as for various milder affections of the skin, such as sore nipples. Made in Germany, it is sold in Britain by Messrs. Chas. Zimmermann & Co., St. Mary-at-Hill, E.C.

Phenolphthalein, Granular Effervescent (Parke, Davis & Co.).—This preparation contains 1 gr. of phenolphthalein in each drachm, and provides a very agreeable means of employing the mild yet effective laxative properties of that drug. It is supplied in bottles of 2 oz. and 4 oz., provided with aluminium screw caps which serve as measures for the dose—200 gr. of effervescent salt, which should be dissolved in a glass of water and taken while effervescing. The bottle must be kept securely corked.

Physostigmine (Eserine).—Messrs. Burroughs Wellcome & Co. have sent us some tabloids, each containing $\frac{1}{400}$ gr. of the salicylate of this alkaloid for ophthalmic use. The great advantage which these tabloids offer is that they are easier to apply without waste than drops: the patient can use them himself without fear of losing half the dose. They do not irritate the conjunctiva.

Pilocarpine Nitrate.—Messrs. Burroughs Wellcome & Co. have also made an ophthalmic tabloid of this salt, the dose in each being $\frac{1}{300}$ gr. What we have said as to the advantages of the tabloid method of dosage of physostigmine applies here with equal force.

Pituitary Extract.—Messrs. Burroughs Wellcome & Co. send us a specimen of their preparation of extract of pituitary gland, in "vaporoles," each containing ·5 c.c. of a solution specially prepared for hypodermic injection. This substance has already attained general recognition as one of the most powerful means of combating shock which we possess, and a perusal of this volume will show that it meets certain indications in obstetric practice. The dose contained in these "vaporoles" is conveniently small.

Pollen Vaccine is manufactured under the direction of Sir Almroth Wright, who has recommended it for the treatment of hay fever, and is sold by Messrs .Parke, Davis & Co. It should be used in conjunction with the hay fever ophthalmo-reaction outfit described on p. 609.

Proposote (Parke, Davis & Co.) is a chemical compound (creosote phenylpropionate) which is insoluble in water and in dilute acids, but is decomposed by alkaline fluids. When administered directly after meals it passes through the stomach without causing irritation, and slowly yields up its creosote in

the intestine. It provides a means of employing the valuable action of creosote in tuberculosis, bronchitis, etc., also in intestinal disorders of bacterial origin. Each globule contains 10 min. of proposote, which quantity is equivalent to 5 min. of creosote, and the average initial dose is one globule after each meal, increased as necessary. Proposote globules are supplied in boxes containing 25 and 100.

Quinine, Phospho-muriate Compound (The Chas. H. Phillips Chemical Co.). —Each fluid drachm contains: free phosphoric acid, 2 min.; potassium phosphate, magnesium phosphate, calcium phosphate, ferric phosphate, of each $2\frac{1}{4}$ gr.; muriate of quinine (equal to nearly $\frac{1}{2}$ gr. bi-sulph.), $\frac{1}{4}$ gr.; strychnine, $\frac{1}{120}$ gr.; syrup and flavouring, q.s. There is no alcohol in this syrup, which is not unpleasant of taste as quinine preparations go. It appears to us to be a reliable substitute for Easton's Syrup, and pleasanter to take, though the dose of strychnine is rather small.

Radiozone Bath Salts.—Messrs. Wright & Co., of Buxton, have manufactured these salts to meet the demand for an effervescent bath containing nascent oxygen, which, it is claimed, does not raise the blood-pressure as carbon dioxide does, but rather tends to lower it. The bath salts are composed of two distinct forms of chemical substances, one being a highly oxygenated body or oxidizer, the other a complex substance possessing the power of breaking up this oxygenated compound, and hence termed a catalyser. Neither of them when used alone is capable of yielding the gas in a form available for use as a medicated bath, but when brought together in the presence of water they give a constant steady flow of oxygen lasting for some time. The chemicals are put up in cylindrical cartons containing the quantities needed for a single bath, the oxidizer occupying about three-fourths of the available space, and the catalyser filling a separate container in the upper part of the carton. Each carton costs 3/–, or 30/– per dozen.

From 25 to 30 gallons of water at a temperature of from 84° F. to 100° F. are run into the bath; the white powder (oxidizer) contained in the bottom of the carton is then sprinkled evenly over the surface of the water; and the powder contained in the small box in the upper part of the carton (the catalyser) distributed in the same way. The patient then enters the bath and remains therein in a recumbent and perfectly quiescent position for from fifteen to twenty minutes. Effervescence, with copious evolution of oxygen, commences almost immediately and continues throughout the period occupied by the bath. On emergence from the bath the body should be gone over with a sponge wrung out of hot water, and then dried with a soft towel.

Radium Bromide is now issued by Messrs. Chas. Zimmermann & Co., in capsules for administration by the mouth. Each capsule contains ·0002 mgram radium bromide.

Radium Emanations are placed within the reach of all practitioners by the appliances advertised by Messrs. Chas. Zimmermann & Co., E.C. One very neat contrivance is a "Radiogen Syphon," which will provide a constant supply of radio-active drinking water. The price is six guineas.

Scarlet-red Ointments.—The application of "scarlet red" (Scharlach R) in the form of an ointment to granulating surfaces, with or without skin-grafts, in order to promote the formation of new epithelium, has attained such general approval on both sides of the Atlantic that we are not surprised at receiving samples of such preparations from three different firms (Messrs. Sumner & Co., Messrs. C. J. Hewlett & Son, and Messrs. Parke, Davis & Co.). The last named send a 5 per cent preparation, while Messrs. Hewlett's contains 8 per cent in combination with boric acid and compound tincture of benzoin. We are glad that practitioners should be able to procure scarlet-red ointments from these as well as from other reliable British firms.

Secretogen is stated by the manufacturers, G. W. Carnrick Co., to be a combination of "prosecretin and succus entericus, obtained from the epithelial cells of the duodenum with the zymogens of the pancreas." Its

object is to stimulate to further activity the secretory mechanism of the alimentary canal where this is behindhand in action. The compound is sold in tablets.

Sodii Lactatis, Elixir.—Lactate of soda is given orally for rapid alkalinization of the urine. The salt is highly hygroscopic, so Messrs. Reynolds & Branson, of Leeds, have prepared a very pleasant elixir as the most convenient form of stocking this drug.

Sprays and Formulæ for the treatment of affections of the nose, ear, and throat have always been a speciality of the well-known firm of Frank A. Rogers, 327, Oxford Street, W. We have received a very interesting price list of these goods, fully illustrated, and Mr. Rogers asks us to state that he will be pleased to send a copy to any of our readers who like to apply for it. From a perusal of this list, and our own experience of the firm's powers in this direction, we cordially recommend practitioners to accept this offer.

Streptococcus Vaccine (Dental).—Messrs. Burroughs Wellcome & Co. have prepared a vaccine from various strains of streptococci obtained from the mouth for use in the treatment of pyorrhœa alveolaris ; the idea being that as streptococci are the predominant organisms in a majority of cases of this disease, the best stock vaccine will be one containing the chief strains of oral streptococci. For those who are inclined to treat this complex infection with stock vaccines, the preparation may be recommended.

Subitol is ammonium ichthosulphonate, which may be applied directly to the skin and mucous membranes as an antiseptic, or given internally as a substitute for ichthyol, e.g., in the treatment of acne rosacea. The agents for this country are Messrs. Chas. Zimmermann & Co.

Sulphacura is the name given by Messrs. Thomas Parker & Co., Temple Sheen Road, East Sheen, S.W., to a product manufactured by them. It is said to be a pentasulphide in solution, and may be used as such in the treatment of wounds, ringworm, etc. A hair-tonic and an ointment containing the same substance are also on the market. The ointment may be usefully employed in the treatment of scabies.

Supermalted Food.—Broadly speaking, the two gross errors committed in the manufacture and sale of certain artificial foods for infants, are that the starch basis is not sufficiently converted into sugar by the action of malt, and that in the directions for preparation sufficient stress is not laid on the absolute necessity for using milk. Messrs. James Woolley, Sons & Co., of Manchester, have issued a food at a reasonable cost which is at all events innocent of these errors. Very clear directions for use appear on each tin, which, if followed, will ensure adequate malting of starch and inclusion of milk.

Tetanus Antitoxic Serum.—Messrs. Burroughs Wellcome & Co. have in stock a series of phials containing this serum in various doses, for use in the prevention and treatment of tetanus, whether in man or beast. American experience in " fourth of July " accidents indubitably proves the prophylactic value of this product, if used immediately after the infliction of contaminated wounds.

Theocin Co. Elixir.—We should like to congratulate Messrs. Sumner & Co. unreservedly on this preparation ; it is an extremely pleasant vehicle for the administration of theocin sodium acetate, a drug for which we have the highest respect. Unhappily, however, a small quantity of digitalis has been added—just so much that a dose of elixir containing an adequate amount of theocin would also contain 5 min. of the tincture of digitalis. Now theocin finds its highest value in the relief of renal dropsy, a condition in which digitalis is often not indicated. We venture to suggest, therefore, that it would be better to put up the elixir with theocin sodium acetate alone, leaving the prescriber to add digitalis if he so desire. The same criticism applies to the elixir prepared by Messrs. Woolley, of Manchester, which, however, contains twice as much digitalis. We are delighted to discern

in these preparations a sign that theocin is receiving the notice to which it is entitled; but we cannot agree that their value is enhanced by the inclusion of digitalis.

Thiomel, Ung. is a specially prepared mineral sulphur ointment containing sulphur in a combined and dissolved form as well as in a state of suspension. It may well be given a thorough trial in all those disorders of the skin in which the application of sulphur is indicated. The manufacturers are the S.P. Charges Co., St. Helens, Lancashire.

Thyroid Gland.—Messrs. Burroughs Wellcome & Co. forward two samples of their standardized thyroid-gland products—tabloids containing $\frac{1}{4}$ and $\frac{1}{10}$ gr. respectively. These preparations are chemically and physiologically standardized, and therefore uniform in action. The doses are small, in accordance with recent authoritative statements as to the efficacy of small doses.

Thyroprotein Tablets (Parke, Davis & Co.).—Thyroprotein is a standardized concentrated extract, consisting of the pure proteid of healthy thyroid gland without the undesirable accompaniments which are often present in commercial varieties of the dried gland. It is prepared according to the method devised by Dr. Beebe, of Cornell University Medical School, New York, and its use is indicated in all disorders dependent upon deficient thyroid secretion. The tablets are made in three strengths, respectively containing 1 per cent, 2 per cent, and 5 per cent of the pure standardized proteid. The dose is one tablet, thrice daily, the strength to be employed depending upon the condition to be treated. Each strength is supplied in bottles of 50 tablets.

Trypsogen is "a combination of the enzymes of the islands of Langerhans with trypsin, amylopsin, and minute doses of gold and arsenic bromides, issued in tablets." It is destined for use in the treatment of diabetes. We have always felt that the enzyme treatment of this disease has not had a full trial, and we hope this preparation, coming as it does from so reputable a firm as the G. W. Carnrick Co., of New York and London, will be applied seriously to the problem of diabetes.

Tuberculin continues to be forwarded to us. Every brand is sold by most of the leading British firms, in a wide range of doses. Moreover, all the requisites for the various tuberculin diagnostic tests are now readily procurable. One interesting example of this latter comes from Messrs. Allen & Hanburys Ltd.—an outfit for the performance of the "*Quanti-Pirquet*" *test* proposed by Dr. E. C. Morland, the principle of which is a quantitative application of the skin reaction to tuberculin inoculation. Tuberculin is sent out in this outfit in a series of strengths, within capillary tubes which are coloured differently according to the doses they contain. The outfit also contains full directions for use.

Uroquin is an interesting preparation manufactured by Messrs. Sumner & Co., and sold in 5 c.c. ampoules. It is a bihydrochloride of quinine and urea, and is destined for use as a local anæsthetic. We have no personal experience of its value, but it enjoys a considerable vogue in America, particularly in operations about the anus. One to three injections, each of 10 or 15 min., should be administered about the site of the intended incision twenty minutes before operation. The resulting anæsthesia lasts, it is said, for many hours.

Vaccines and Sera prepared by the Swiss Serum and Vaccine Institute, Berne, are sold in this country by Messrs. Sumner & Co. Samples of gonococcus vaccine and diphtheria antitoxin have been sent us. The Berne Institute is under government control, and its products are perfectly reliable.

Valkasa (Messrs. James Woolley, Sons & Co. Ltd., Manchester).—This is a tonic food containing casein and glycerophosphates, and is designed for use in neurasthenia and allied disorders. As it is free from purins and carbohydrates, it may also be used in gout and diabetes. The flavour is pleasant, the price is reasonable, and the methods of preparation are many and easy. We expect that this product will find many friends.

BOOKS OF THE YEAR.

A List of the Principal Medical Works and New Editions Published during 1912.

*** For the convenience of our readers any of the works in this list can be obtained from Messrs. John Wright & Sons Ltd., "Medical Annual" Offices, Bristol.*

AMBULANCE AND NURSING.

Ambulance Work. Questions and Answers upon "First Aid to the Injured." By J. W. Martin and John Martin. 17th ed. Pp. 108. *Baillière* *Net* 1*s.*

Before the Doctor Comes. By Andrew Wilson. Cr. 8vo, pp. 278. *Nash* *Net* 2*s.* 6*d.*

British Red Cross Society First-Aid Manual. By James Cantlie. 12mo, No. 1. 123 Illus., pp. 236; No. 2. pp. 224. 89 Illus. and 4 Charts. Limp. *Cassell* - - - - - *each, Net* 1*s.*

Cooking for Invalids in Home and Hospital. By Florence Jack. New Edition. Revised and enlarged. Cr. 8vo, pp. 208. *Jack* *Net* 2*s.*

Day Nurseries and Their Management. By Bernard Myers. Cr. 8vo, pp. 58. Limp. *Scientific Press* - - - - *Net* 1*s.*

First Aid in Accidents. By Sir John Collie and C. F. Wightman. 16mo. boards. *G. Gill* - - - - - - *Net* 9*d.*

First Steps to Nursing. A Manual for Would-be Probationers. By Mabel H. Cave. Cr. 8vo, pp. 128. Boards. *Partridge* - - *Net* 1*s.*

Food for the Invalid and the Convalescent. By W. S. Gibbs. Cr. 8vo, pp. 92. *Macmillan* - - - - - *Net* 3*s.* 6*d.*

Handbook for Attendants on the Insane. Published by the Authority of the Medico-Psychological Association. 6th ed., much enlarged. Pp. 405. 20 Illus. *Baillière* - - - - - *Net* 2*s.* 6*d.*

Handbook for Nurses. By J. K. Watson. 5th ed. New and Revised. Cr. 8vo, pp. 544. Profusely Illus. *Scientific Press* - - *Net* 5*s.*

Handbook of Nursing. By M. N. Oxford. 6th ed. Cr. 8vo, pp. 328. *Methuen* - - - - - - - *Net* 3*s.* 6*d.*

Historical Outline of Ambulance from the Earliest Times. By Charles H. Miles. 18mo, sewed. *J. Wright & Sons Ltd.* - *Net* 3*d.*

Home Nurses' Handbook of Practical Nursing. By Charlotte A. Atkins. Cr. 8vo, pp. 276. *Saunderson* - - - *Net* 6*s.* 6*d.*

Home Nursing. By C. F. Wightman. 16mo, boards.. *G. Gill* *Net* 9*d.*

Hospital Sisters and Their Duties. By Eva C. E. Lückes. 4th ed., thoroughly revised and partly rewritten. Cr. 8vo, pp. 244. *Scientific Press* - - - - - - - *Net* 2*s.* 6*d.*

How to Become a Nurse. A Guide to Training as a Hospital Nurse. Full particulars of Methods of Training, Salaries, Uniform, Recreation, etc., of each Training School in the United Kingdom. By Sir Henry Burdett. New ed. Entirely Revised. Cr. 8vo. *Scientific Press* - *Net* 2*s.*

Index of Practical Nursing. By J. Basil Cook. Cr. 8vo, pp. 172. *Baillière* *Net* 2*s.*

Lectures on the Nursing of Infectious Diseases. By F. J. Woolacott. 2nd ed. Revised and Enlarged. Cr. 8vo. *Scientific Press* *Cloth, Net* 2*s.* 6*d.*

MANUAL FOR WOMEN'S VOLUNTARY AID DETACHMENT. By P. C. Gabbett. 16mo, limp. *J. Wright & Sons Ltd.* - - - *Net* 1s.

NOTES ON HOME NURSING, WITH HINTS ON HYGIENE. By Mabel D. Goldie 3rd ed. Pp. 158. *Bailliere* - - - *Net* 1s. 6d.

NURSES' COMPLETE MEDICAL DICTIONARY. By M. Theresa Bryan. 16mo, pp. 208. *Baillière* - - - - - *Net* 2s.

NURSES' PRONOUNCING DICTIONARY OF MEDICAL TERMS AND NURSING TREATMENT. By Honnor Morten. Revised by Mary I. Burdett. 7th ed. Cr. 8vo. *Scientific Press* *Cloth*, 2s. *Leather, gilt*, 2s. 8d.

NURSING MIRROR ENCYCLOPÆDIA AND DIARY, 1913. 18mo, cloth. *Scientific Press* - - - - - - - *Net* 6d.

OPHTHALMIC NURSING. By Sydney Stephenson. 3rd ed., revised and enlarged. Cr. 8vo, pp. 244. *Scientific Press* - - *Net* 3s. 6d.

PRIMARY NURSING: TECHNIQUE FOR FIRST YEAR PUPIL NURSES. By I. McIsaac. Cr. 8vo. *Macmillan* - - - - *Net* 5s.

TEXT-BOOK FOR NURSES: ANATOMY, PHYSIOLOGY, SURGERY AND MEDICINE. By E. W. Hey Groves and J. M. F. Brickdale. *Oxford Medical Publications.* 205 Illus. Roy. 8vo, pp. 432. *H. Frowde* - *Net* 12s. 6d.

THE SCHOOL NURSE, HER DUTIES AND RESPONSIBILITIES. By C. Louis Liepoldt. Cr. 8vo, pp. 208. *Scientific Press* - - *Net* 2s. 6d.

ANATOMY AND PHYSIOLOGY.

AIDS TO HISTOLOGY. By Alexander Goodall. Fcap. 8vo, pp. 144. 20 Illus. *Baillière* - - - *Cloth, Net* 2s. 6d. *Paper, Net* 2s.

ANATOMY. Part I. *Catechism Series. Livingstone* - - *Net* 1s.

ANATOMY AND TOPOGRAPHY OF THE ACCESSORY AIR SINUSES OF THE NOSE IN CHILDHOOD. By A. Onodi. An Atlas containing 102 specimens from photographs, with a Preface by W. Waldeyer, Director of the Anatomical Institute of the University of Berlin. Imp. 8vo. *Bale* *Net* 21s.

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COMPEND OF HUMAN PHYSIOLOGY. By A. P. Brubaker. 13th ed. *Oxford Medical Publications.* Cr. 8vo. *H. Frowde* - - *Net* 5s.

CUNNINGHAM'S MANUAL OF PRACTICAL ANATOMY. By D. J. Cunningham. Vol. I. and II, 5th ed. Edited by Arthur Robinson. Cr. 8vo, pp. 702 each. *H. Frowde* - - - - - - *Net* 10s. 6d.

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EXPERIMENTAL PHYSIOLOGY. By E. A. Schäfer. Demy 8vo, pp. 120. *Longmans* - - - - - - *Net* 4s. 6d.

GROWTH OF BONE. Observations on Osteogenesis. By William Macewen Demy 8vo, pp. 210. *MacLehose* - - - *Net* 10s.

LANDMARKS AND SURFACE MARKINGS OF THE HUMAN BODY. By L. Bathe Rawling. 5th ed. Demy 8vo, pp. 104. *H. K. Lewis* - *Net* 5s.

MANUAL OF HUMAN OSTEOLOGY. By A. Francis Dixon. 178 Illus. Cr. 8vo, pp. 328. *H. Frowde* - - - - *Net* 10s. 6d.

MODERN MICROSCOPY. A Handbook for Beginners and Students, with Chapters on Special Subjects. By M. I. Cross and Martin J. Cole. 4th ed., revised and enlarged. Demy 8vo, pp. 344. 113 Plates and other Illus. *Baillière* - - - - - - *Net* 6s.

NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE. By A. Rendle Short. 2nd ed., revised and enlarged. Cr. 8vo, pp. 256. *J. Wright & Sons Ltd.* - - - - - - - *Net* 5s.

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PRACTICAL ANATOMY. By D. J. Cunningham. Vol. II. 5th ed., revised by Arthur Robinson. Cr. 8vo, pp. 646. *H. Frowde.* - *Net* 10s. 6d.

PRACTICAL ANATOMY. By J. C. Heisler. 8vo. *Lippincott* - *Net* 21s.

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PRINCIPLES OF HUMAN PHYSIOLOGY. By Ernest H. Starling. Roy. 8vo, pp. 1426. *Churchill* - - - - - *Net* 21s.

PRINCIPLES OF PHYSIOLOGY. By J. G. McKendrick. *Home University Library.* 12mo, pp. 256. *Williams & Norgate* - - *Net* 1s.

STUDENT'S HUMAN PHYSIOLOGY. A First Year's Course in the Practice and Theory of the Subject. By Ernest Evans. Cr. 8vo, pp. 320. *G. Allen* *Net* 5s.

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BACTERIOLOGY.

BACTERIA. By — Schottelius. Translated from the German by Staff-Surgeon Herbert Geoghegan. *Oxford Medical Manuals.* 2nd ed. Pp. 324. 10 Coloured Plates and 33 Illus. *H. Frowde* - *Net* 8s. 6d.

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Jersey.—*Cranbourne Hall,* Grouville. Med. Supt., A. C. Stamberg, M.D. Access—Grouville, 2 mins. walk. *See also p.* 827

The Grove. Res. Med. Prop., F. N. Gaudin, M.R.C.S. 2½ miles from St. Heliers, 2 from St. Aubin's.

Jersey Asylum. Res. Med. Supt., Julius Labey, M.R.C.S. Access—Gorey Village, 1 mile.

Kilkenny.—*District Asylum.* Res. Med. Supt., Louis Buggy, L.R.C.P. Access—Kilkenny station, ¼ mile.

Killarney.—*District Asylum.* Res. Med. Supt., E. W. Griffin, M.D. Asst. Med. Off., G. W. Downing, L.R.C.P. & S. Access—Killarney, ½ mile.

Kirkintilloch (near Glasgow).—*Westermains Private Asylum.* For ladies. Licensee, Mrs. J Lawrie.

Knowle (near Fareham).—*County Asylum.* Med. Supt., H. K. Abbott, M.D. Access—Knowle platform, ⅛ mile.

Lancashire, nr. Newton-le-Willows.—*Haydock Lodge,* Private Mental Hospital. Res. Med. Prop., Dr. C. T. Street. Access—Newton-le-Willows, 2 miles.

Lancaster. — *County Asylum.* Res. Med. Supt., D. M. Cassidy, M.D. Also *The Retreat,* for private patients. Access—Lancaster, L. & N.W. and Midland stations, each 1¼ miles. *See also p.* 823

The Royal Albert Institution, Lancaster (for the feeble-minded of the Northern Counties; 750 patients). Res. Med. Supt., Dr. A. R. Douglas. Secretary, Saml. Keir. Access—Lancaster station, 1 mile; and *Brunton House,* a Private Home in connection with the Royal Albert Institution. *See also p.* 831

Larbert (Stirlingshire). — *Scottish National Institution* (for education of imbecile children). Med. Supt., Dr. R. D. Clarkson. Sec. & Treas., A. J. Fitch, Virginia Buildings, Glasgow. Access—Larbert station, ¾ mile.

Leeds (near Menston).—*West Riding Asylum.* Res. Med. Supt., S. Edgerley, M.D. Access—Guiseley, 1 mile.

Leek (Stafford).—*County Asylum,* Cheddleton. Med. Supt., W. F. Menzies, M.D. Access — Wall Grange station, 1 mile.

Leicester.—*Mental Hospital,* Humberstone. Res. Med. Supt., J. F. Dixon, M.D. Access—Leicester.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Access—Narborough, ¾ mile; Leicester, 6 miles.

Letterkenny.—*Donegal District Asylum.* Res.Med.Supt., E. E. Moore, M.D. Asst. Med. Off., J. C. Martin, L.R.C.S.I. Access—Letterkenny and Lough Swilly Rly., 1 mile.

Lichfield.—*County Lunatic Asylum,* Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Access—Lichfield City, 3½ miles; Trent Valley, 4½ miles; Hammerwich, 1½ miles.

Limerick.—*District Asylum.* Res. Med. Supt., Dr. E. D. O'Neill. Access—Limerick station, ½ mile.

Lincoln.—*County Asylum,* Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. Access—2½ miles from Lincoln G.N.R. station.

The Lawn, Lincoln. Res. Med. Supt., Arthur P. Russell, M.B. Access—Lincoln station 1 mile.
See also p. 824

Liverpool.—*Shaftesbury House,* Formby, near Liverpool and Southport. Res. Med. Supt., Stanley A. Gill, B.A., M.D. Access—Formby station, ¼ mile distant. *See also p.* 821

Tue Brook Villa, Liverpool, E. Res. Med. Supts., Drs. Tisdall & Ingall. Access—Tue Brook station or Green Lane car. *See also p.* 817

London.—*Bethlem Royal Hospital,* Lambeth Road, London, S.E. Res. Med. Supt., W. H. B. Stoddart, F.R.C.P.; and Convalescent Home at Witley, Surrey. *See also p.* 826

Bethnall House, Cambridge Road, N.E. Res. Med. Supt., J. K. Will, M.D. Access—Cambridge Heath station. *See also p.* 830

Brooke House, Clapton, N.E. Res. Med. Supt., Dr. Gerald Johnston. Cons. Phys., J. O. Adams, J.P., M.D. Access—Clapton, G.E.R.

Camberwell House, Peckham Road, S.E. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Offs., H. J. Norman, M.B., B.Ch., D.P.H., and W. L. Holyoak, M.D. Tel., "Psycholia, London." Telephone, Hop. 1037.
See also p. 826

Chiswick House, Chiswick. Res. Lics., Dr. T. S. Tuke and C. M. Tuke, M.R.C.S. Access—Chiswick station, ½ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites, B.A. Med. Off., Dr. Percy Smith. Access—Clapham Rd., and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. *See also p.* 830

Featherstone Hall, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Access—Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streatham Hill. Res. Med. Supt., T. Duncan Greenlees, M.D., F.R.S.E. Access—Tulse Hill, 5 minutes.

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore. Access—C. & D. R. Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Access—Sunbury station, 1¼ mile.

Hayes Park (for ladies), Hayes, Middlesex. Res. Med. Off., Dr. J. W. Higginson. Access—Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., F. W. Edridge-Green, M.D., F.R.C.S. Access—By M.R., Hendon station, ½ mile, or 'bus from Tube at Golder's Green.

London County Asylum, Banstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Access—Belmont station, ½ mile; Sutton station, 1½ miles.

London County Asylum, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, M.B. Access—Bexley station, 1¼ miles.

London County Asylum, Cane Hill, Coulsdon, Surrey. Res. Med. Supt, Sir J. M. Moody. Access—Coulsdon, S.E.R., or Coulsdon and Smitham Downs, L.B. & S.C.R., 10 minutes.

London County Asylum, Claybury, Woodford, Essex. Res. Med. Supt., Robert Jones, M.D. Access—Woodford station G.E.R., 1½ miles.

London County Asylum, Colney Hatch, N. Res. Med. Supt., S. J. Gilfillan, M.A., M.B. Access—New Southgate, G.N.R.

London County Asylum, "The Manor," Epsom. Res. Med. Supt., W. Ireland Donaldson, M.D. Access—L. & S.W. and L.B. & S.C.R.

London County Colony (for Insane Epileptics), Ewell, Epsom. Res. Med. Supt., Dr. M. A. Collins. Access—L. & S.W. & L.B. & S.C.R. stations, 1½ miles.

London County Asylum, Hanwell. Res. Med. Supt., Dr. P. J. Baily.

London County Asylum, Horton, Epsom. Res. Med. Supt., Dr. J. R. Lord. Access—L. & S.W. Rly., 1½ miles, L.B. & S.C.R., 1¾ miles.

London County Asylum, Long-Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. Access—L. & S.W.R. and L.B. & S.C.R.

Middlesex County Asylum, Tooting, S.W. Med. Supt., R. Worth, M.B., B.S. Access—Wandsworth Common station, 1 mile.

Moorcroft House, Hillingdon, Uxbridge, 2 miles; London, 13 miles. Med. Licensees, Dr. R. J. Stilwell, and Dr. R. H. Cole. Access—West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W. (for gentlemen). Prop. and Res. Phys., Dr. J. Noel Sergeant. Access—Balham station, 1 mile, and tram. *See also p.* 828

Northumberland House, Green Lanes, N. Res. Med. Supt., Bernard Hart, M.D. Access—Finsbury Park station, 1 mile. *See also p.* 827

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., A. H. Sutherland. Lady Supt., Mrs. Chapman. Access—West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile. *See also p.* 828

Peckham House, 112, Peckham Road, S.E. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Access—Peckham Rye station, 10 minutes' walk. *See also p.* 825

St. Luke's Hospital, Old St., E.C. Res. Med. Supt., Wm. Rawes, M.D., F.R.C.S. Convenient to principal London stations. *See also p.* 825

The Grange, East Finchley, N. Res. Licensees, Dr. F. and Mrs. Watson.

The Priory, Roehampton, S.W., near Richmond Park. Res. Med. Supt., James Chambers, M.D. Access—Barnes station, 10 mins.

West Ham Boro' Asylum, Goodmayes, Ilford. Res. Med. Supt., Dr. D. Hunter. Access—Goodmayes, ¾ mile.

Wood End House, Hayes (ladies). Uxbridge, 3 miles; London, 12 miles. Med. Lic., Dr. Stilwell. Access—Hayes station, 1 mile.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. Hetherington. Access—Londonderry, 1 mile.

Macclesfield.—*Parkside Asylum.* Res. Med. Supt., J. C. McConaghey, M.D. Also *Uplands*, a large detached villa for private patients. Access—Macclesfield, 1 mile. *See also p.* 820

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. W. Lewis, M.D. Access—Maidstone, 1½ miles.

West Malling Place, Kent. Res. Med. Supt., Dr. G. H. Adam. Access—Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House.* Prop., Major Reilly. Res. Med. Supt., Dr. J. Selfe Lush. Access—Lavington, 1½; Devizes, 6 miles.

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Access—Maryborough, ½ mile.

Melrose, N.B.—*Roxburgh District Asylum.* Res. Med. Supt., J. C. Johnstone, M.D. Access—Melrose, 1 mile.

Melton.—*Suffolk District Asylum*, near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Access—Melton station, 1¼ miles; Woodbridge station, 2¼ miles.

Middlesbro'.—*County Boro' Asylum.* Res. Med. Supt., Dr. J. W. Geddes. Access—Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Access—Monaghan, ¼ ml.

Montrose, N.B. — *Montrose Royal Lunatic Asylum.* Phys. Supt., John G. Havelock, M.D. Access—Hillside, ¼ mile; Dubton, 1 mile.

Morpeth. — *Northumberland County Asylum.* Res. Med. Supt., Thos. W. McDowall, M.D. Access—Morpeth station, 1 mile, by 'bus.

Mullingar. — *District Asylum.* Res. Med. Supt., Dr. Laurence Gavin. Access—Mullingar station, 1 mile.

Nelson (Lancs.). — *Marsden Hall.* Licensee and Med. Supt., P. G. Mould, M.R.C.S. Access—Nelson station, L. & Y. Rly.

Newcastle-on-Tyne.—*City Asylum,* Gosforth. Res. Med. Supt., James T. Callcott, M.D. Access—Newcastle, 4 miles.

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Access—Castle station, 2½ miles; Midland station, 3 miles.

St. Andrew's Hospital. Med. Supt., J. Bayley, M.R.C.S. Access—Northampton station, 1 mile.

Norwich.—*Heigham Hall.* Res. Phys. and Prop., J. G. Gordon-Munn, M.D. Access—Victoria station, 1 mile. Thorpe station, 1½ miles.

Norfolk County Asylum, Thorpe, Norwich. Res. Med. Supt., D. G. Thomson, M.D. Access—Whitlingham, 1 mile; Norwich, 2½ miles.

Norwich City Asylum, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Access—Hellesdon, 1 mile.

The Bethel Hospital for the Insane. Res. Med. Supt., S. J. Fielding M.B. Cons Phys., Saml. J. Barton, M.D. Access—Norwich (Thorpe) station, 1 mile. *See also p.* 823

The Grove, Old Catton, near Norwich (for ladies.) Res. Med. Supt., C. A. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum,* Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Asylum. Med. Supt., S. L. Jones, M.R.C.S. Access—Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., W. B. Tate, M.D. Access—Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles.

Omagh. — *District Asylum.* Res. Med. Supt., Geo. E. Carre, M.B. Access—Omagh station, 1½ miles.

Oxford.—*County Asylum,* Littlemore. Res. Med. Supt., T. S. Good, M.R.C.S. Access—Littlemore station.

The Warneford, Oxford, 1½ miles. Res. Med. Supt., James Neil, M.D. Access—Oxford station, 2¼ miles. *See also p.* 829

Paisley.—*Lunatic Ward,* Poorhouse, Craw Road. Vis. Med. Off., Hugh C. Donald, M.D.; Res. Med. Off., Winifred M. Ross, M.B., Ch.B., Access—Paisley, 1 mile.

Paisley District Asylum, Riccartsbar. Med. Off., D. Fraser, M.D. Access—Paisley West, ¼ mile.

Perth.—*District Asylum,* Murthly. Res. Med. Supt., Lewis C. Bruce, M.D. Access—Murthly.

James Murray's Royal Asylum, Perth (for private patients only). Phys. Supt., A. R. Urquhart, M.D., F.R.C.P. Ed. Access—Perth station, under 2 miles. *See also p.* 826

Plympton. — *Plympton House,* Plympton, South Devon. Res Props., Dr. Alfred Turner and Dr. J. C. Nixon. Access—Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also p.* 828

Portsmouth.—*Borough Asylum.* Res. Med. Supt., B. H. Mumby, M.D., D.P.H. Access—Fratton, 1½ miles. *See also p* 817

Prestwich (nr. Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Acc.—Prestwich, 1 mile.

Rainhill (near Liverpool).—*County Asylum.* Res. Med. Supt., J. Wiglesworth, M.D. Access—St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Access—Grange Lane station, G.C.R., ½ mile. *See also p.* 829

St. Albans (Hill End).—*Herts County Asylum.* Med. Supt., A. N. Boycott, M.D. Access—Hill End station, G.N.R., 2 minutes.

St. Leonards-on-Sea.—*Ashbrook Hall*, Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles Somerset. Med. Supt., Dr. J. Farrant Fry. Access—Warrior Square station, 2 miles.

Salisbury.—*Fisherton House Asylum*. Med. Supt., Dr. R. T. Finch. Access—Salisbury station, 5 minutes.

Laverstock House. Res. Med. Supt., E. C. Plummer, M.R.C.S. Access—Salisbury, 1½ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Wm. H. C. Macartney. Access—Sevenoaks station, S.E.R., ¾ mile.

Shrewsbury. — *Shropshire County Asylum*. Res. Med. Supt., D. F. Rambaut, M.D. Access—Shrewsbury station, 2½ miles.

Sleaford.—*Kesteven County Asylum*. Med. Supt., J. A. Ewan, M.A., M.D. Access—Rauceby, G.N.R., ¼ mile.

Sligo.—*District Asylum*.—Res. Med. Supt., Dr. Joseph Petit. Access—Sligo station, 1½ miles.

Stafford.—*County Asylum*. Res. Med. Supt., Dr. J. W. S. Christie. Access—Stafford, 1 mile.

Institution for the Insane, Coton Hill. Res. Med. Supt., Dr. R. W. Hewson. Access—Stafford, 1 mile.
See also p. 823

Starcross (near Exeter).—*Western Counties Training Institution for the Feeble-minded*. Res. Supt., E. W. Locke. Access—Starcross station, G.W.R., 5 minutes.

Stirling.—*District Asylum*, Larbert. Med. Supt., Dr. R. B. Campbell. Access—Larbert, 1½ miles.

Stone (near Aylesbury). — *Bucks County Asylum*. Res. Med. Supt., H. Kerr, M.D. Access—Aylesbury station, 3¼ miles.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Prop., E. Hollins, M.A. Access—Tamworth station, ¾ mile. *See also p.* 831

Taunton.—*Somerset & Bath Asylum*, Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Access—Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Asylum*. Props., Drs. H. & A. Newington. Access—Ticehurst Road, 3 miles; Wadhurst S.E. & C.R., 4 miles.

Tonbridge. — *Redlands*. Res. Med. Supt., W. A. Harmer, L.S.A. Access—Tonbridge junc., S.E. & C.R., 2½ miles.

Virginia Water. — *Holloway Sanatorium*, Hospital for the Insane. St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., G.W. Smith, M.B., C. E. C. Williams, M.D., and Emma M. Johnstone, L.R.C.P. & S. Access — Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's*, Canford Cliffs, Bournemouth. Med. Off., Alexr. M. Stafford, M.B. *See also p.* 830

Wadsley (near Sheffield). — *South Yorkshire Asylum*. Res. Med. Supt., W. J. N. Vincent, M.B. Access—Wadsley Bridge, 1 mile.

Wakefield. — *West Riding Asylum*. Res. Med. Supt., J. Shaw Bolton, M.D. Access—Kirkgate and Westgate station, 1 mile.

Wallingford (Berks).—*Berkshire Asylum*.—Res. Med. Supt., J. W. A. Murdoch, M.B. Access—Cholsey 1 mile.

Warlingham (Surrey). — *Croydon Mental Hospital*. Res. Med. Supt., E. S. Pasmore, M.D. Access—Croydon, 6 miles; Upper Warlingham, 3¼ miles. *See also p.* 822

Warwick.—*Midland Counties Institution*, Knowle, near Birmingham (for feeble-minded children). Sec. and House Gov., A. H. Williams. Med. Off., J. O. Hollick, M.B., M.R.C.S. Access—Knowle, ½ mile.

Waterford.—*District Asylum*. Res. Med. Supt., J. A. Oakshott, M.D. Access—G. S. & W. R., North station, 2 miles.

St. Patrick's Private Asylum, Belmont Park. Conducted by the Brothers of Charity. Med. Supt., W. R. Morris, M.B. Access—Waterford station, 1 mile.

Wells.—*Somerset and Bath Asylum*, Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Access—Wells station, 1½ miles; Masbury station, 2½ miles.

Whitchurch (Salop). — *St. Mary's House* (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Access—Whitchurch, 1 mile.

Whitefield (near Manchester).—*Overdale*. Res. Phys., P. G. Mould, M.R.C.S. Access—Prestwich and Whitefield station, 1½ miles; Molyneux Brow, ¼ mile.

Whittingham (nr. Preston).—*County Asylum*. Res. Med. Supt., Dr. J. F. Gemmel. Access—Grimsargh station, 1¾ miles; Whittingham station, 3 minutes.

Winchelsea (Sussex).—*Periteau*, near Hastings (for ladies). Res. Phys., Harvey Baird, M.D. Access—Winchelsea station, 1 mile.

Witham (Essex).—*The Retreat*. Licensees, Drs. Haynes & Race. Res. Med. Supt., Dr. J. P. Race. Access—Witham station, ½ mile.

Woking. — *Surrey County Asylum*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Access—Brookwood station, 1¼ miles.

Worcester.—*County & City Lunatic Asylum*, Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Access—Worcester station, 4 miles.

York.—*The Pleasaunce* (ladies only). Res. Med. Prop., Dr. A.W. Llewelyn Jones. Access—York, 1½ miles.

The Retreat, York. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). Access—York station, 1½ miles. Also *Throxenby Hall*, a branch house, near Scarborough. *See also p.* 822

Bootham Park Registered Hospital, York. Res. Med. Supt., C. K. Hitchcock, M.D., M.A. Cantab. Access—York station, 1 mile.

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. Access—York, 2 miles.

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchalder (N.B.).—*Inverness-shire Sanatorium*. Med. Supt., D. S. Johnston, M.D. Access—Aberchalder, 2 miles.

Aysgarth, S.O. (Yorks). — *Wensleydale Sanatorium*. Med. Supt., Edwd. M. Hime, M.B., Ch.B. Access—Aysgarth, ½ mile, via Northallerton, N.E.R., and Hawes Junction, M.R. *See also p.* 810

Banchory (Scotland).—*Nordrach-on-Dee*. Res. Phys., D. Lawson, M.A., M.D. Access—Banchory station, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne and Northumberland Sanatorium*. Res. Med. Off., Dr. W. C. Rivers. Access—Barrasford, N.B.R., 4 miles.

Belbroughton (Worcs.). — *Bourne Castle Open-air Sanatorium*. Apply Res. Phys., W. Bernard Knobel, M.D. Access—Hagley, G.W.R.; Bromsgrove, M.R.

Benenden (Kent). — *Sanatorium* of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis." Two Res. Med. Officers. Apply, Secretary. Access—Biddenden station, 3 miles.

Bingley (Yorks.). — *Eldwick Sanatorium* (for women and children). Vis. Phys., Dr. Margaret Sharp. Access—Bingley station, 2 miles.

Bolton (Lancs).—*Wilkinson Sanatorium for Consumptives*. Med. Off., Dr. J. D. Marshall. Sec., F. Nightingale, 12, Acresfield, Bolton.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Phys., Dr. Henry Holroyd. Access—Bournemouth station, 1 mile. Terms 7/6 per week and a Governor's nomination.

The Firs Home (for advanced cases). Hon. Sec., Colonel R. F. Anderson, Bournemouth. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss MaGuire. Access—Bournemouth Central. ½ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt., J. E. Esslemont. M.B., Ch.B. Access—Bournemouth Central, 2½ miles; Boscombe, 1½ miles; Christchurch, 2½ miles.

See also p. 810

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland.* Hon. Treas., J. P. Maclay, Esq., 21, Bothwell Street, Glasgow. Med. Supt., John Guy, M.D. Access—Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townsfolk. Objects: educational, and for treatment of both early and advanced cases. Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium.* Res. Med. Supt., Dr. C. H. Berry. Access — Moretonhampstead, G.W.R., 6 miles; Okehampton station, L. & S.W.R., 11 miles.

Cheddar (Somerset).—*Engel Home*, (for gentlewomen and girls). Med. Supt., R. W. Statham, M.R.C.S. Apply to Lady Supt. Access—Cheddar station, 10 minutes.

Cheltenham.—*Cotswold Sanatorium.* Cons. Phys., Dr. F. K. Etlinger. Address — Cotswold Sanatorium, near Stroud.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. A. K. Traill. Access—Leckhampton, 2½ miles.

Chesterfield (Derbyshire).—*The Ashover Sanatorium.* Med. Supt., Dr. Ida E. Fox. Access—Stretton, M.R., 3½ miles. *See also p.* 811

Danbury (Essex).—*Alfred Boyd Memorial Sanatorium* (for ladies), Little Gibcracks, Essex.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Med. Supt., C. S. Steavenson, M.B. Access—Dinsdale, N.E.R., 5 mins.

See also p. 810

Devon and Cornwall *Sanatorium.* Didworthy, South Brent. For consumptive poor of the two counties. Hon. Sec., S. Carlile Davis, Esq., Princess Chambers, Princess Sq., Plymouth. Res. Med. Supt., Dr. W. B. Livermore. Access — Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Access—Buttevant, G.S. & W R., 5 miles.

Dorking (Surrey). — *Woodhurst Sanatorium* (for women and children), Tower Hill. Sec., Mrs. G. Wright. Visiting Phys., Miss Mary R. McDougall, M.B., C.M.Ed. Access—L.B. & S.C.R. and the S.E. stations, both about 1½ miles.

Dundee (near), *Sidlaw Sanatorium* Res. Med. Off., Dr. H. E. Watson. Access—Auchterhouse stat. 1½ mls.

Durham.—*Durham County Consumption Sanatoria.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. Terms free and by payment. For men: Stanhope, Med. Supt., Dr. John Gray. Access—Stanhope station, 1 mile. For women and children: Wolsingham, Med. Supt., Dr. Menzies. Access—Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption* (for the treatment of poor patients). Visiting Physicians, Dr. R. W. Philip and Dr. G. L. Gulland. Clerk and Treasurer, L. B. Bell, C.A., 42, Castle Street, Edinburgh.

Woodburn Sanatorium, Morningside, Edinburgh. Res. Med. Prop., Mrs. I. Mears, L.R.C.P.I.

Eversley (Hants).—*Moorcote Sanatorium.* Res. Med. Supt., J. G. Garson, M.D. Access—Wellington College station, 4½ miles; Wokingham sta., 6 miles; Fleet, 6 miles.

Farnham (Surrey).—*Crooksbury Sanatorium.* Res. Phys., Dr. George Fleming. Access—Farnham station, 3½ miles; Tongham, 2½ miles; Ash, 4 miles. *See also p.* 809

Whitmead Sanatorium, Tilford. Res. Phys., J. Hurd-Wood, M.D. Access—Farnham station, 3½ miles.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases.* Res. Phys. Dr. C. J. Alexander. Sec., J. Osborne, Scottish Provident Building. Belfast. Access—Belfast, 2 miles, Mainly for the poor; 6 beds free; others by small payment.

Frimley (Surrey).—*Brompton Hospital Sanatorium.* Res. Med. Supt., Dr. W. O. Meek. Access—Frimley station, 2 miles.

Grange-over-Sands.—*Westmorland Sanatorium.* Res. Med. Supt., C. F. Walker, M.D. Access—Grange-over-Sands station, 2¾ miles.

Hastings.—*Fairlight Sanatorium,* in connection with Margaret Street Hospital for Consumption and Diseases of the Chest (for Out-Patients), 26, Margaret St, London, W. Sec., Mabel C. Hawthorne. Med. Off., Dr. N. F. Stallard. Access—Hastings, Tram, about 15 minutes. Payments; by subscriber's letter, 11/6, without, 17/6.

Heswall (Cheshire). — *West Derby, Liverpool, and Toxteth Park Joint Sanatorium.* Med. Supt., J. B. Yeoman, M.D.

Hull.—*Hull and East Riding Convalescent Home,* Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproulle, L.R.C.P. Access—Withernsea stat.

Isle of Wight. — *Royal National Hospital for Consumption,* Ventnor. Senr. Res. Med. Off., Dr. Edgar Taunton. Sec., Charles W. Cox, 18, Buckingham Street, Strand, W.C. Terms 10/– per week and a recommendation from a Governor. Access—Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for advanced cases). Apply to the Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Access—Ventnor, 5 mins. drive. Terms, by selection, 10/6 per week.

Kinross-shire (Scotland).—*Coppin's Green Sanatorium and Ochil Hills Sanatorium,* Milnathort. Access.—Kinross junction, 4 miles.

Kirkcaldy. — *Sanatorium for Consumption.* Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk.

Lanark.—*Bellefield Sanatorium.* Res. Med. Supt., Dr. J. W. Allan. Access—Lanark, 20 minutes.

Lanchester (Durham).—*Maiden Law Sanatorium.* Med. Off., Dr. W. M. Morison. Sec., W. H. Ritson. Access—Annfield Plain station, 1 mile.

Leeds.—*Leeds Sanatorium for Consumptives,* Gateforth, near Selby, and *Leeds Hospital for Consumptives,* Armley. Sec., C. H. Sedgwick, 37, Great George St., Leeds. Terms free, for poor of Leeds.

Liverpool.—*Liverpool Sanatorium for Consumptives,* Kingswood, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., A. Adams, M.D. Access—Frodsham station, L. & N.W.R., 3½ miles.

Llanybyther (Carmarthenshire). — *West Wales Sanatorium.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. H. O. Blanford. Access—Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of Chest,* Victoria Park, E. Open-air treatment provided. Res. Med. Off., Dr. C. D. S. Agassiz. Sec., Geo. Watts. Access—Cambridge Heath, G.E.R., 5 minutes.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead. Access—Finchley Road (Met.) station, 1 mile. *Sanatorium at Northwood.* Access—Northwood (Met. & G.C. Rly.) Hon. Vis. and Res. Staff. Secretary, W. J. Morton.

Royal Hospital for Diseases of the Chest, 231, City Road, E.C. Med. Off., Dr. D. B. Evans. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Sanatorium,* "The Beeches." Med. Director, Dr. Annie McCall, 165, Clapham Road, S.W. Access—Forncett station, G.E.R., 4 miles.

See also p. 811

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest.* Hospital at Bowdon; Crossley Sanatorium, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester. Res. Phys. (Bowdon), Dr. R. D. B. Frew; (Delamere), G. Heathcote, L.R.C.P., & S. Access—Bowdon: Altrincham station, ½ mile. Delamere: Moldsworth or Frodsham, 3½ miles.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W. Access — Margate West ¼ mile.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Access—Wells station, 2¾ miles.
See also p. 809
Nordrach-upon-Mendip, Blagdon, near Bristol. Res. Phys., R. Thurnam, M.D. Access—Burrington station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., N. D. Bardswell, M.D. Access—Midhurst, 4 miles.

Nayland (Suffolk). — *East Anglian Sanatorium*, and *Maltings Farm Sanatorium* for poor men and women patients. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Access—Bures station, G.E.R., 3½ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenaften. Res. Med. Supt., E. E. Prest, M.D. Access—New Cumnock, 3 miles.

Norfolk.—*Kelling Sanatorium*, Holt. Assistance given to poor patients unable to pay. Hon. Sec., Dr. H. W. McConnel. Res. Med. Supt., Mr. J. I. W. Morris. Access—Holt station, 1½ miles.
Mundesley Sanatorium, Mundesley. Res. Phys., S. Vere Pearson, M.B. Access—Mundesley, 1 mile.

Northallerton Yorks). — *Ruebury Sanatorium*, Osmotherley. Res. Med. Prop., H. B. Luard, F.R.C.S. Access—Northallerton, N.E.R., 8 miles. Trenholme Bar, 4 miles.
See also p. 811

Northampton.—*Northamptonshire Sanatorium*, Creaton. Res. Med Supt., Dr J. A Kilpatrick Access—Brixworth station, L. & N.W.R., 3 miles.

Nottingham.—*Ransom Sanatorium*, Sherwood Forest, Mansfield, for persons of limited means, resident in Notts and district. Res. Med. Off., Dr. G M. Dobrashian. Access—Mansfield, 3 miles. Free on recommendation of subscribers.

Oban, Scotland. — *Argyll County Sanatorium*. Vis. Med. Off., Duncan MacDonald, M.D. Hon. Sec., Roger McNeill, M.D. Access—Oban, 1 mile.

Ockley *Sanatorium* (Surrey). Res. Phys., Dr. Clara Hind. Access—Ockley, L.B. & S.C.R., 1 mile.

Painswick (Glouc'stershire).—*Painswick Sanatorium*, Cotswold Hills. Res. Phys. and Prop., W. McCall, M.D. Access—Stroud, 4 miles; Gloucester, 6 miles.

Peebles.—*Manor Valley Sanatorium*. Res. Phys., Dr. Harley.

Penmaenmawr (N. Wales).—*Nordrach in Wales, Pendyffryn Hall*. Res. Phys., Dr. G. Magill Dobson.

Peppard Common (Oxon).—*Kingwood Sanatorium*, for ladies; *Maitland Sanatorium*, for working classes. Med. Supt., Dr. Esther Carling. Access—Reading, 6½ mls.

Ringwood (Hants).—*Linford Sanatorium*. Res. Phys., H. G. Felkin, M.D., A. de W. Snowden, M.D., and H. A. F. Wilson, M.R.C.S. Access—Ringwood station, 2½ miles.

Rudgwick (Sussex). — *Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall. Access—Rudgwick station, 5 minutes; Horsham station, 7 miles.
See also p. 811

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall*. Res. Prop., Dr. G. A. Crace-Calvert. Access—Ruthin station, 2 miles.
See also p. 811

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Sec., Hubert W. Green. Res. Phys., T. Gambier, M.D. Fee, 11/- weekly, with subscriber's letter, available 4 weeks. Access—West St. Leonards S.E.R., West Marina L.B. and S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Res. Phys., H. N. Marrett, M.R.C.S. Access—Chelmsford stat., G.E.R., 3½ miles.

Sheffield. — *City Hospitals for Consumptives* (for females), Commonside; (and for males), Crimicar Lane. Med. Supt., H. J. E. H. Williams, M.D.

Shirlett, near Broseley (Shropshire). — *King Edward VII Memorial Sanatorium*. Res. Med. Supt., Dr. F. H. Pearce. Access—Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium*, for males. Conducted by Bradford Board of Guardians. Med. Supt, B. H. Slater, F.R.C.S. Res. Med. Off., Dr. C. Eglington. Access—Embsay station, 2 miles.

Stannington (Northumberland). — *"Philipson" Children's Sanatorium.* Matron, Miss S. M. Robson. Med. Supt., A. T. Alleson, M.D. Access—Stannington station, 3 mls.

Threlkeld (Cumberland). — *Blencathra Sanatorium.* Res.Med. Supt., Dr. W. Goodchild. Access—Threlkeld, C. K. & P. R., 2 miles.

Torquay.—*Mildmay Consumption Home* for advanced cases (women) only. Hon.Med.Offs., F. D. Crowdy, M.D., and H. P. Wiggin, M.R.C.S. Hon. Sec., Miss F. Gumbleton, Connemara, Torquay. Access—Torquay, 1 mile. Fees, 10/6 weekly, or 7/- with subscriber's letter.

Western Hospital, Torquay. Open Oct. to May. Sec., F. Manley. Terms, 7/6 weekly by nomination, 12/6 without.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium.* Res. Phys., B. H. Steede, M.D. Access—Warrenpoint. *See also p.* 810

Wicklow.—*The Royal National Hospital for Consumption for Ireland,* Newcastle, Wicklow. Hon. Sec., J. R. Orpen, 13, South Frederick Street, Dublin. Res. Med. Off., Dr. Chas. D. Hanan. Access—D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles. Minimum fees, 7/- weekly, on subscriber's recommendation and medical examination.

Winsley, near Bath.—*Winsley Sanatorium.* For residents in the Counties of Bristol, Gloucester, Somerset and Wilts. Res. Med. Off., — — — ; Sec., Frederic Jones. Access—Limpley Stoke station, 1 mile.

Wokingham.—*Pinewood Sanatorium.* Res. Med. Supt., H. J. Phillips, M.R.C.S. Sec., Ernest Sykes, 34, Clements Lane, E.C. Access—Wellington College, S.E.R., 2 miles; or Wokingham, S.W.R., 3½ miles.

Yelverton (South Devon). *Udal Torre Sanatorium.* Res. Med. Supt. and Prop., J. Penn Milton, M.R.C.S.

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879–1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an "Inebriate" within the meaning of the Acts.

* NOTE:—Ashford is a Roman Catholic Religious Institution.

† Cinderford, Herne Hill, Terrington St. Clement, and Torquay, are C.E.T.S. Institutions.

MALES ONLY.

Buntingford (Herts). — *Buntingford House Retreat.* Two Res. Physicians. Access — Buntingford, G.E.R., 8 minutes. *See also p.* 815

Cinderford† (Glos.).—*Abbotswood House Inebriate Retreat.* Chaplain Supt., Rev. S. Scobell-Lessey, M.D. Access—Ruspidge or Cinderford. *See also p.* 814

Cockermouth (Cumberland).—*Ghyllwoods.* Res. Med. Prop., Dr. J. W. Astley Cooper. Access—Cockermouth, 11 miles. *See also p.* 812

Colinsburgh (Fife).—*Invernith Lodge.* Res. Med. Supt. and Licensee, Dr. W.H.Bryce. Access—Kilconquhar station, 4½ miles. *See also p.* 813

Folkestone.—*Capel Lodge,* near Folkstone. Res. Prop., E. Norton, M.D. Access — Folkestone Junction, 2 miles. *See also p.* 816

Rickmansworth (Herts).—*Dalrymple House.* Apply to Res. Med. Supt. Access — Rickmansworth station, Great Central & Metropolitan Railway, ½ mile; L. & N.W.R., 1 mile. *See also p.* 815

FEMALES ONLY.

Ashford, near Staines.*—*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply to the Mother Superior. Access—Ashford station, 1 mile. *See also p.* 812

Belfast. — *The Lodge Retreat,* Irwin Avenue, Strandtown. Med. Supt., R. W. Leslie, M.D.

Beverley (E. Yorks).—*Albion House.* Res. Supt., the Matron. Hon. Sec., Mrs. T. R. Pentith, The Limes, Sutton-on-Hull. Vis. Phys., Geo. Savege, M.D. *See also p.* 812

Brighton.—*Park Gate*, Preston Road. Lady Supt., Sister Mary. Med. Off., R. J. Ryle, M.D., J.P.

Erdington, nr. Birmingham.†—*Corngreaves Lodge.* Lady Supt., Miss Knapman. Med. Off., Dr. Featherstone. Access—Gravelly Hill station, ¼ mile. *See also p.* 814

Fallowfield. — *The Grove Retreat*, near Manchester. Licensee, Mrs. M. Hughes. Med. Offs., A. T. Wilkinson, M.D., J. W. Hamill, M.D., G. Ashton, M.D., and Dr. Florence Robinson. Hon. Treas., S. Gamble. Access—Fallowfield station, 10 minutes. *See also p.* 816

Herne Hill.†—*Ellison Lodge*, Half Moon Lane. Res. Supt., Miss Corner. Med. Supt., Dr. T. H. Underhill. Access—Herne Hill, 10 minutes; North Dulwich, 3 minutes. Telephone: 1162 Brixton. *See also p.* 814

Leicester.—*Melbourne House*, Prop., Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D., Camb. London Consultant, W. Wynn Westcott, M.B. (Coroner N.E. London), 396, Camden Road, Holloway. Dublin Consultant, Sir Wm. J. Smyly, M.D., F.R.C.P.I., 58, Merrion Square, Dublin. Nat. Tel., 769 Leicester. Station, 2 miles. *See also p.* 816

Newmains (N.B.).—*Newmains Retreat* for ladies. Licensed under Inebriates Acts. Access—Hartwood stat., Cal. Railway.

Reigate (Surrey). — *Duxhurst*, for women of all classes. Supt., Sister in charge. Med. Supt., A. Walters, M.R.C.S. Access—Reigate, 4 miles. *See also p.* 816

Spelthorne St. Mary (Bedfont, Middlesex). — Apply to Sister Superior, C.S.M.V. Access—Feltham, S.W.R., 1 mile.

Licensed under Inebriates Acts. Females—Primarily Gentlewomen and Middle Class (24). Treatment—Physical, Moral, and Spiritual.

See also p. 816

Terrington St. Clement† (Norfolk).—*Hamond Lodge.* Res. Supt., Miss Yolland. Med. Supt., S. R. Lister, M.R.C.S. Access—Terrington station, 1½ miles. *See also p.* 814

Torquay.† — *Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, M.D., F.R.C.S. Hon. Sec., Mrs. H. H. Erskine.

See also p. 814

Wandsworth. — *Northlands Retreat*, 20, Bolingbroke Grove, Wandsworth Common, S.W. Lics., Dr. J. Round and the Misses Round. Access — Wandsworth Common station, L.B. & S.C.R.

REFORMATORIES CERTIFIED UNDER THE INEBRIATES ACT, 1898.

Male and Female.

Bristol.—*Brentry certified Inebriate Reformatory*, Westbury-on-Trym. Res. Supt., Capt. Lay; Med. Officer, Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Access—Clifton Down, Redland, or Patchway station, 3½ miles.

Cattal (Yorkshire).—*Yorkshire Inebriate Reformatory*, Cattal, near York. For Yorkshire cases. Res. Supt. and Med. Off., Dr. F. P. Hearder. Access—Cattal, 1 mile.

Females Only.

Ackworth (Yorkshire).—*North Midlands Inebriate Reformatory.* Res. Supt., the Officer in Charge. Med Off., Dr. Oyston. Access—Ackworth station, 1½ miles.

Bristol.—*Royal Victoria Home*, Horfield. Med. Off., Dr. C. Bernard. Hon. Sec., Rev. H. N. Burden. Access—Montpelier and Bristol stations.

Chesterfield (Derbyshire).—*Midland Counties Inebriate Reformatory*, Whittington. Med. Off., Dr. A. M. Palmer. Access — Whittington station, ½ mile; Chesterfield, 5 miles.

East Harling (Norfolk). — *Eastern Counties Inebriate Reformatory*, East Harling, near Thetford. Res. Med. Supt., Dr. E. J. Manning. Access—Harling Road station, 3½ miles.

Horley (Surrey).—*Farmfield*. For London cases, under Sec. II of the Act. Res. Supt., Miss Forsyth. Med. Off., Dr. C. F. Williamson. Access—Horley station, 2½ miles.

Langho (Lancashire). — *Lancashire Inebriate Reformatory*, Langho, near Blackburn. For Lancashire cases. Res. Supt. and Med. Off., Dr. F. A. Gill. Access—Langho station, 1½ miles.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium*, The Mansion, Beckenham Park. Med. Supt., F. Hare, M.D. Phys., H. L. Ewens, M.D. Prop., Access—Beckenham Junc. station, 10 minutes. *See also p.* 814

Dublin.—*Farnham House*, Finglas. Res. Med. Supt., H. P. D'Arcy Benson, M.D. Access—Dublin, 2 miles. *See also p.* 817

Durham. — 24, Allergate, for friendless and inebriate women; 4/– per week. Hon. Sec., Miss King. Med. Supt., Dr. Smith. Access—Durham, ½ mile.

Edinburgh. — *Queensberry Lodge*, for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Access —Waverley station, ½ mile. *See also p.* 814

Harrogate (Near).—*Hill House*, Starbeck, Yorks., for women. Apply, Matron. Med. Off., Dr. Petch. Access—Starbeck station, ½ mile.

Heybridge, (Essex). — *Osea Island*, (for ladies and gentlemen). Vis. Phys., H. I. Price, F.R.C.S. Prop, F. N. Charrington, Esq.

Hounslow (Middlesex).—*West Holme*, for middle-class and working women. Med. Supt., Dr. G. A. S. Gordon. Access—S.W. & Dist. Rly., ¼ mile.

Liverpool.—*Temperance Home*, 318 Upper Parliament Street, for women. Supt., Miss A. J. Wilson. Med. Officer, C. E. Soloman, M.D. Access—Edge Hill station.

Port Stewart Co. Derry).—*Ballyaughrin Sanatorium*. Med. Supt., Dr. J. Quin Donald. *See also p.* 812

HYDROPATHIC ESTABLISHMENTS.

We wish to make this list complete, but it is impossible when some Proprietors do not return our letter of enquiry, which is *stamped for reply*. This will account for some omissions in the present edition.

Ben Rhydding. — *Ben Rhydding Hydro*. Phys., Dr. F. J. Stansfield and Dr. W. R. Bates. Access—Station, a few hundred yards.

Bournemouth (Hampshire).—*Bournemouth Hydropathic*. Res. Phys., W. J. Smyth, M.D. Access —East station, 1½ mile; West station, ¼ mile.

Bridge of Allan.—*Bridge of Allan Hydropathic Co.* Manageress, Mrs. Gregory. Access—Station, ¼ mile.

Bristol. — *The Bristol Hydropathic* (formerly Bartholomew's Turkish Baths), College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S.

Bute.—*Kyles of Bute Hydropathic*, Port Bannantyne, Rothesay. Man., A. Menzies. Med. Supt., Dr. A. J. Hall. Access—Clyde steamers call daily.

Buxton.—*Buxton Hydro*. Manager, G. W. Bosworth. Access—Station, 4 minutes.

The Peak Hotel. Apply the Manageress. Access—Buxton station. *See also p.* 796

Caterham (Surrey). — *Surrey Hills Hydropathic.* Res. Med. Supt., A. B. Olsen, M.D. Access—Caterham station. *See also p.* 805

Clifton (near Bristol).—*Clifton Grand Spa and Hydropathic.* Access—Clifton Down station, 1 mile; Bristol station, 1½ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Phys., M. Orb, M.D., Erlangen (Germany). Access—Blarney sta., 2½ miles; Muskerry Light Railway from Cork, station on grounds.

Crieff. —*Strathearn House* (17 miles from Perth). Res. Med. Supts., Thos. H. Meikle, M.D., J.P., and T. Gordon Meikle, M.B., C.M. Access—Crieff station, 1 mile.

Eastbourne. — *Eastbourne Hydropathic.* Manager, W. J. Grimes. Access — Eastbourne station, 5 minutes' drive.

Edinburgh.—*Hydropathic*, Slateford. Man. Director, J. Bell. Access—Merchiston, 1 mile; Waverley, 3 miles.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Access—Forres station, 1 mile; Inverness, 24 miles.

Grange - over - Sands. — *Hazelwood Hydropathic.* Physicians, Richard Lowther, M.D., and Owen Gwatkin, M.R.C.S. Access—Carnforth, L. & N.W.R., and thence by Furness Railway; Grange-over-Sands, ¼ mile.

Harrogate (Yorkshire).—*The Cairn Hydropathic.* Man., Mrs. Baker. Access—Harrogate station, ½ mile.

The Harrogate Hydropathic. Phys., Dr. T. Johnstone. Access—Harrogate station, ½ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. D. Stewart. Access—Hexham, 1 mile; Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med. Supt., Chas. W. E. Toller, M.D. Apply to the Secretary. Station, 1 mile. *See also p.* 795

Ilkley (Yorkshire). — *Craiglands Hydro., Lim.* Res. Med. Supt., Henry Dobson, M.D., C.M.

The Spa Hydropathic, near Leeds and Bradford. Manager, A. Moorhouse. Vis. Phys., Dr. T. B. Hearder. Access—Ilkley, 3 mins.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Access—Limpley Stoke station.

London. — *Nevill's Turkish Baths*, Charing Cross, W.C., and York Terrace, Marylebone Road, N.W. Light Baths, Douches, Sulphur and Electric Baths, Vibro-Massage, etc. *See also p.* 806

Malvern.—*The Malvern Hydropathic.* Res. Prop., Dr. J. N. F. Fergusson. Access—Great Malvern station, ¼ mile.

Wyche-side Hydropathic. Access—Malvern Wells station, G.W.R., ½ mile; Great Malvern station, 2 miles.

Matlock. — *Matlock House Hydropathic*, Matlock. Secretary, Jno. McLaren, 150, Leadenhall Street, E.C. Access—Matlock, M.R., ¼ mile.

Rockside Hydropathic, Matlock. Med. Supts., Drs. Marie Goodwin (Resident) and Dr. Morton. Access—Matlock, ¾ mile. *See also p.* 800

Royal Hotel and Baths, Matlock Bath. Phys., W. C. Sharpe, M.D. Access—Matlock Bath station.

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Access—Matlock station, ½ mile; omnibus. *See also p.* 801

Moffat. — *The Moffat Hydropathic.* Man., Miss Gardner. Med. Supt., Dr. D. Huskie. Access — Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Complete modern equipment of baths and electrical treatment. Plombières treatment for mucous colitis. Fango di Battaglia (Mud packs for sciatica, etc.). Res. Phys., Thomas D. Luke, M.D., F.R.C.S.Edin. Access—N.B. and Cal. stations about 10 to 15 mins. walk. *See also p.* 803

Scarborough.—*Seacroft Private Hotel.* Telephone 401. *See also p.* 796

Shandon. — *Shandon Hydropathic.* Consulting Phys., Dr. Wm. R. Sewell. Access—Shandon station, 5 mins.

Skelmorlie. — *Wemyss Bay Hydropathic.* Med. Supt., Dr. W. C. Philp. Access—Wemyss Bay station, ½ mile. *See also p.* 797

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations. *See also p.* 805

Kenworthy's Hydropathic, Southport. Res. Phys., Dr. Kenworthy. Access—Chapel Street (L. & Y.), Lord St. station (Cheshire Lines), ¼ mile. *See also p.* 805

Tunbridge Wells.—*The Spa Hotel.* Access—Station, about 1 mile; London, 34 miles. Apply, Manager. *See also p.* 796

Ulverston.—*Conishead Priory Hydropathic.* Vis. Phys., Dr. R. Ashburner. Access — Ulverston station, 1¾ miles.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS.

Bournemouth.—*Victoria Nurses' Institute,* Cambridge Road. Matron, C. Forrest. Access—Bournemouth West station. *See also p.* 790

Bristol.—*General Hospital.* Matron, Miss A. Densham. Sec., Wm. Thwaites. Access—Temple Meads station, G.W.R. and M.R., ¾ mile. *See also p.* 790

Leamington.—*Private Nursing Association, Ltd.,* Radford Road; also Surgical and Medical Home. Apply, Mrs. J. Ward. *See also p.* 775

London.—*Miss Hooper's Trained Nurses' Association,* 9, Upp. Baker Street, N.W. Apply to Miss Hooper. *See also p.* 786

London Temperance Male and Female Nurses' Co-operation, 18, Adam Street, Portman Square, W. Secretary, C. Webb. *See also p.* 788

Male Nurses Association, 29, York Street, Baker Street, W. Sec., W. J. Hicks. *See also p.* 789

Mental Nurses' Co-operation, 49, Norfolk Square, W. Lady Supt., Miss Jean Hastie. *See also p.* 788

National Hospital Male Nurses' Association, Queen Square, W.C. Apply to Lady Superintendent. Tel. No. 4594 Central. *See also p.* 790

New Mental Nurses' Co-operation, 85, Edgware Road, Marble Arch, W. Mental and Nerve Cases. Apply Superintendent. *See also p.* 788

St. Luke's Hospital, Old Street, E.C. Trained Nurses for Mental, and Nervous Cases. Apply Matron. *See also p.* 790

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W.; also at Manchester and Glasgow. Secretary, M. D. Gold. *See also p.* 1.

Sunderland. — *Nursing Inst. and Home for Trained Nurses.* Matron, Miss C. Aldis.

Thoroughly reliable Nurses supplied for Medical, Surgical, Mental, and Maternity cases.

York.—*The Retreat* (Trained Nurses' Department, for mental and nervous cases only). *See also p.* 822

PRIVATE HOMES FOR INVALIDS.

Alderley Edge (Cheshire). — *The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for Epileptic Boys). Director, Alan McDougall, M.D. Access —Warford, near Alderley Edge, Cheshire. *See also p.* 791

Bath.—*Lansdown Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Med. Supts., Dr. Percy Wilde, and Dr. Wells-Beville. Access—M. or G.W. stations, 1 mile. *See also p.* 784

Bournemouth. — *Victoria Nursing Institute and Home*, Cambridge Road (for paying patients). Apply the Matron. *See also p.* 790

Broadstairs.—*Bishopsbourne Invalid Home*, East Cliff (for children of the middle classes). Apply, Lady Superintendent. *See also p.* 811

Chorley Wood (Herts).—*The Laburnums*, Heronsgate. Private Home for epileptic, paralytic, and other cases. Apply, Miss King. Access —Chorley Wood station, 1½ miles. *See also p.* 791

Erdington.—*Rosevale Homes for Paying Patients*, Penns Lane. Rest Cure, Massage, etc. Apply, Miss C. L. Fallows. Access—Chester Road stat., ¼ mile. *See also p* 784

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified). Prop.,Philip H. Harmer. Access—Buxted, 3 miles; Mayfield, 4 miles; Heathfield, 4 miles. *See also p.* 784

Jedburgh.—*Abbey Green*. Res. Prop., Wm. Blair, M.D. Access—N.B.R., Jedburgh. Telephone No. 3. *See also p.* 791

London.—*Manna Mead*, 17, The Grove, Blackheath, S.E. (for invalids and convalescents). Principals, Mrs. Knight and Miss Tapley Spurr. Access—Lewisham Junc., 15 minutes' walk. *See also p.* 785

Ravenscroft House, Golders Green, N.W. Neurasthenia and other nervous diseases. Apply, Dr. Sidney Roberts. *See also p.* 789

St. Thomas's Home, St. Thomas's Hospital, Westminster Bridge. Apply, Sydney Phillips, B.A., St. Thomas's Hospital, S.E. Access —Waterloo, 5 minutes. Tel.: Hop. 1637. *See also p.* 787

White Hall, South Norwood Hill, S.E. Nervous, slight mental disorders, and medical cases. Apply, Medical Superintendent. *See also p.* 785

Malvern (West).—*Hazelwood*, West Malvern. Slight mental, retarded development, or aged. Apply, Miss Brogden. *See also p.* 793

Mousehole (Cornwall). — *Lynwood*. Medical and Rest Cure Home. Apply, Miss Enid Smith, M.B., B.S. (Lond.). *See also p.* 786

New Brighton.—*Convalescent Home for Women and Children*. Hon. Treas. and Sec., Frank Holt, Esq., 8, Cook Street, Liverpool. Lady Supt., Miss K. R. Bolton. *See also p.* 787

Reigate Hill (Surrey).—*The Beeches*, Wray Lane. Nerves, Rest Cure, Massage, Electricity, Diet. Apply, Miss Goslett. *See also p.* 792

Southwold (Suffolk).—*Avenue House* (Nursing Home). Apply to Miss Gibbs. *See also p.* 785

Stanmore (Middlesex). — SCARLET FEVER *Convalescent Home* (*The Mary Wardell*). Vis. Phys., A. Muir, M.D. Hon. Sec., Miss M. Wardell. Access—Stanmore, 2 miles, and tramcars. *See also p.* 787

Swanmore, Ryde, I.W.—*St. Luke's Home* for Epileptic Churchwomen, Swanmore, Ryde, I.W. Med. Supts., A. Banks, F.R.C.S., and Dr. S. Churchill, Ryde. *See also p.* 791

Tunbridge Wells.—*Mount Ephraim Nursing Home*, 8, Molyneux Park. Medical, Surgical, Weir-Mitchell, and Massage cases. Excellent facilities for open-air treatment. Apply, Miss Baxter. Access—Station, 10 mins. *See also p.* 788

Westcliff-on-Sea.—*St. Ursula*, King's Road. Medical and Rest Home. Apply, Miss Haslock. *See also p.* 793

PRINCIPAL BRITISH SPAS,

With Indications for their Therapeutical Employment.

Revised by N. Hay Forbes, F.R.C.S. Edin., F.R.S. Edin.

Bath (Somerset).—Sheltered from the N. and N.E. winds by a range of hills from 600 to 800 feet high; 2 hours from London (Paddington), 12 miles from Bristol. Rainfall, 25·01 inches in 1911, and sunshine, 1911 hours. Climate mild and equable.

Waters.—The only *hot* springs in Great Britain. Three springs yield over half a million gallons of water daily, the temperature of the hottest is 120° F. The waters contain sulphates of calcium, strontium, sodium, and potassium, with calcium carbonate, the chlorides of magnesium, sodium, and lithium.

Therapeutic indications.—Gout, chronic rheumatism, rheumatoid arthritis, sciatica, disorders of the digestive organs, anæmia, skin diseases, functional nervous disorders and debility.

Baths.—Modern baths of every description, including Aix douche massage, deep baths, electric, water and hot air, natural vapour, needle, intestinal douches for muco-membranous colitis and allied conditions, sulphur, Nauheim, and Zander medico-mechanical treatment.

Nursing and Baths.—Lansdown Grove House (*See p.* 784).

Bridge of Allan (Stirlingshire).—422 miles from London, 3 miles north of Stirling. Sheltered from the north and east winds by the Ochil Hills. On the direct route to London, and within an hour's rail journey of Edinburgh and Glasgow. Average rainfall 33·24 inches. Climate mild and equable all the year.

Waters.—Natural mineral waters from six springs at a depth of about 116 feet, exceedingly rich in saline, the chief ingredients being various salts of calcium, sodium, and magnesium. These waters are once more coming into great prominence.

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, and in rheumatism, gout, sciatica, and other nerve affections, also some diseases of the skin.

Baths.—Excellent suite of baths, with skilled attendants.

Buxton (Derbyshire).— 1000 feet above sea level, 3½ hours from London (St. Pancras), 23 miles from Manchester, 30 from Sheffield, 53 from Liverpool. Bracing climate. Rainfall, 40·20 inches in 1911, and 1512 hours of sunshine. Lowest absolute humidity of any health resort in Great Britain.

Waters.—Thermal springs 82°F. Powerful radio-active properties. More highly charged with nitrogen gas than any other spring. Chalybeate spring.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, nervous diseases, skin diseases, especially those of gouty origin, malaria and other tropical diseases, colitis, anæmia, phlebitis, and diseases of women.

Baths.—Over 70 different treatments. Every proved treatment installed. Recent official report of Devonshire Hospital gives percentage of cures as 88·6 per cent extending over last five years. (*See also p.* 797).

Hotel.—The Peak Hotel (*See p.* 796).

Cheltenham (Gloucestershire). — 184 feet above sea level, 3 hours from London. Rainfall, 21·73 inches in 1911, and sunshine, 1746 hours. Town very free from fogs. Protected from N. and N.E. winds.

Waters.—The mineral waters are of two kinds. One is alkaline from contained sodium carbonate, the other is impregnated with the sulphates of soda and magnesia. They are now receiving considerable attention from the medical profession, and seem likely to successfully compete with Carlsbad and Vichy in attracting a portion of the patients formerly sent abroad.

Therapeutic indications.—Gout, dyspepsia, metabolic disorders generally, and neurasthenia.

Baths.—Good modern baths, with massage.

Church Stretton (Salop). — 613 feet above sea level, in the "Highlands of England," 4¼ hours from Euston, 3¾ hours from Paddington, 1½ hours from Birmingham, 2½ hours from Liverpool and Manchester, and 2½ hours from Bristol. Air noted for its extreme purity, bracing, with a somewhat tranquillizing influence, and a generally invigorating climate. Hills 1250 to 1700 feet high. Prevailing wind, S.W. Rainfall, 29·24 inches in 1911. Modern drainage. Porous soil.

Waters.—Said to be the purest in England; useful in gout, rheumatism, chronic renal affections, and arteriosclerosis.

Therapeutic indications.—Specially the "open-air" cure of neurasthenia, for sequelæ of influenza, insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation. "Terrain cure," and special physical exercises for obesity, myocardial atony, early arteriosclerosis, hepatic inadequacy and constipation. A good "after-cure" resort from Bath, Buxton, Cheltenham, Droitwich, Leamington, and Llandrindod Wells.

Droitwich (Worcestershire). — 150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall 23 inches. Mean winter temperature 47° F., summer 69·9° F. Well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (channel), containing in every gallon 20,000 grains of saline in excess of any known waters: the waters possess radio-active properties.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar to Nauheim treatment—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, skin diseases of a dry, scaly nature, e.g., chronic eczema and psoriasis

Baths.—Immersion, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, etc.

Hotel.—Worcestershire Brine Baths Hotel, and Brine Baths (*See p.* 798).

Harrogate (Yorkshire). — 400 feet above sea level, 4 hours from London, 18 miles from Leeds, 20 from York. The climate is stimulating and fairly dry—bracing moorland air. Rainfall in 1911, 27·92 inches, and sunshine, 1542 hours.

Waters.—Celebrated for the medicinal properties of its 80 springs—sulphurous, chalybeate, alkaline, and saline.

Therapeutic indications.—Anæmia, chlorosis, gout, rheumatism, disorders of liver and stomach, muco-membranous colitis, chronic appendicitis, and skin diseases.

Baths.—There are four establishments, where numerous treatments are given, including sulphur baths, douche, Nauheim, vapour, Russian, Turkish, electric, mineral, electric light, ozone, throat and nasal.

Ilkley (Yorkshire). — Situated on the southern slope of the valley of the Wharfe, rising rapidly from the bank of the river to a height of 1320 feet above sea level; distant 16 miles from Leeds, 14 from Bradford, and 18 from Harrogate. Occupying a sheltered position The annual rainfall, 32 inches, is considerably less than on the other side of the river, with fewer rainy days. Mean annual temperature 48° F. Death-rate 8 per 1000. Being in close proximity to extensive moors the air is bracing and exhilarating and at the same time dry and soft, having a wonderfully restorative effect upon invalids such as Anglo-Indians, delicate children, and convalescents.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Leamington Spa (*See* Royal Leamington Spa).

Llandrindod Wells (Radnorshire). — Situated in Central Wales, at an altitude of 750 feet. About 5 hours from London on the L. & N.W. Ry. It lies in the centre of a plateau of hills rising in places to over 2000 feet. Sheltered from the east, and open to the south and west. The soil is porous, and dries up quickly after rain. The climate is extremely bracing. Rainfall about 35 inches.

Waters.—There is a great variety of mineral waters—saline, sulphurous, iron, magnesium, chloride of calcium, and lithia springs similar in composition to those at Kissingen and Homburg. Slightly aperient and strongly diuretic.

Therapeutic indications.—The diseases most benefited are those in which any digestive derangements are present, the various forms of gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus, or any kidney or bladder condition requiring diuresis, neurasthenia, or debility from over-work or convalescence.

Llangammarch Wells (Breconshire). — In an open valley surrounded by moorland, 600 feet above sea level. On the L. and N.W. Ry., 5¾ hours from London, 4 from Manchester, 4¼ from Liverpool. Mean annual temperature 47·5° F., summer 55·4° F. Sunshine in 1911, 1492 hours, and rainfall 50·70 inches. Well protected from the east.

Water.—Saline, containing the chlorides of barium (6¾ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles. The barium salt has a physiological action on cardiac muscle similar to that of digitalis and strophanthus, and is also a good diuretic. Administered both internally and externally. Temperature 56° F.; is heated for bathing purposes. A modified Nauheim system of baths, exercises, massage, and hill climbing is carried out.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Baths.—Immersion, douche, and needle.

Malvern (Worcestershire).—Situated at an altitude of 520 feet above sea level, on eastern slope of Malvern Hills (9 miles long and rising to 1400 ft.), 2½ hours from London (Paddington), and about 1 hour from Birmingham. Original home of hydropathy. Soil gravelly (syenitic detritus). Air dry and bracing, cool in summer and warm in winter. Rainfall, 25·50 inches in 1911. Mean annual temperature 49·58, with low daily variation. Lowest death-rate of any inland watering place. Sanitation perfect. (*See also p.* 799).

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic indications. — Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Baths.—Natural pure brine (from Droitwich), Turkish and electric baths, Vichy massage and Aix douches, Fango-di-Battaglia.

Nursing Home.—Hazelwood, West Malvern (*See p.* 793).

Matlock Bath (Derbyshire).—300 to 800 ft. above sea level, 3½ hours from London (St. Pancras), 46 miles from Manchester, 16 from Derby. Rainfall in 1911, 27·33 inches, and sunshine, 1512 hours. One of the most sheltered towns in England.

Waters.—Thermal Springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium

bicarbonate, and magnesium sulphate. Owing to their peculiarly soft and unctuous character they are especially valuable in bathing and douche operations, particularly those associated with massage, such as the "Aix" and "Vichy" douches.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Fango-di-Battaglia.—The volcanic mineral deposit from the hot springs near Padua (N. Italy) is imported, and extensively used in the treatment of gout, rheumatoid arthritis, and neuritis.

Matlock Bank (*Matlock* station, one mile by rail from Matlock Bath). — 300 to 800 feet above sea level, 3½ hours from London (St. Pancras), 45 miles from Manchester, 17 from Derby. South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal Hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant light and heat, Schnee four-cell, X rays, etc. They also include Turkish, Russian, plunge, medicated and inhalation baths, Aix and Vichy douches

A feature of the Matlock Hydros is that, as a rule, they are complete in their own grounds, and contain croquet and tennis lawns, and bowling and putting greens, which, as a means of recreation and exercise, form a valuable auxiliary to a course of hydropathic treatment.

Hydropathic Establishments.—Rockside Hydropathic (*See p.* 800) and Smedley's Hydropathic (*See p.* 801).

Peebles (Peebleshire, N.B.). — 500 ft. above sea level. One hour from Edinburgh and 8 from London (viâ Galashiels). Rainfall, 27 inches. Bracing climate, but sheltered from the north winds. Mean annual mortality rate 11 per mil. Population 6000 in winter, and 10,000 in summer.

Waters.—The waters are of the halothermal type, similar to Kissingen and Kreuznach. The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well.

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, and, in this respect, seem likely to compete with the above-mentioned continental resorts, patients being saved the long journey, and also, after the baths, are conveyed by lift immediately to their rooms for resting. The waters are also suited to dyspepsia, gout, rheumatism and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p.* 803).

Ripon (Yorkshire). — Situated on rising ground near the junction of the Rivers Ure and Skell. On the N.E. Railway, 4¾ hours from London. 120 feet above sea level. Climate mild but bracing. Soil, gravel and sand, and dries quickly after rain. Prevailing winds, W. and S.W. Surrounding country well wooded and very beautiful, Fountains Abbey and many other places of interest are within easy reach. The Yorkshire Moors are only a few miles from the City.

Waters.—Saline Sulphur Water brought down from Aldfield Spa, 4 miles distant to the New Baths erected in 1904.

Therapeutic indications.—Chronic and subacute gout and rheumatism, rheumatoid arthritis, skin diseases (eczema, psoriasis, acne), catarrhs, gastric and liver derangements.

The Baths have been lately equipped with up-to-date electric apparatus for electric treatments (*See also p.* 802).

Royal Leamington Spa (Warwickshire).—195 feet above sea level, 1 hour 30 minutes from London (Paddington or Euston), 24 miles from Birmingham. Equable and mild climate, with low rainfall. Westerly winds prevail.

Waters.—Saline. Resembling those of Homburg, but are more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylopoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension and chronic interstitial nephritis.

Baths.—Turkish, medicated, swimming, and electric of all kinds.

Nursing.—Private Nursing Association Ltd. (*See p.* 775.)

Strathpeffer Spa (Ross-shire, N.B.).—In the Highlands of Scotland. 180 to 300 feet above sea level. Through carriages twice a week during summer from London, 15 hours. Sheltered from N. and N.E. winds. Prevailing wind S.W. Sandy soil. Bracing air. Sunshine in 1911, 1253 hours, and rainfall, 26·30 inches.

Waters.—Sulphurous and chalybeate. Former, very rich in sulphuretted hydrogen gas and sulphates. Four sulphur wells in use: (1) Old well; (2) Upper; (3) Strong; (4) Cromartie. No. 4 contains over 19 cubic inches H_2S to gallon. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic and subacute gout and rheumatism (especially articular), rheumatoid arthritis, chronic skin diseases (eczema, acne, psoriasis), especially when gouty or rheumatic, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, neurasthenia, anæmia, obesity, chronic metallic poisoning, dilatation of heart, neuritis.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Hotel.—The Ben Wyvis Hotel (*See p.* 804).

Trefriw Wells (Carnarvonshire).—A chalybeate spa in the Conway valley, one mile from Llanrwst station (L. & N.W.Ry.) between Conway and Bettws-y-Coed; 5 hours by rail from London, 4 from Leeds, and 2½ from Liverpool. The season is from the latter half of April to the end of September, but this spa is "open all the year round." The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type; it is recommended for the convalescent and the neurasthenic.

Waters.—Two varieties: (1) The aluminous chalybeate, and (2) the sulpho-magnesian chalybeate; the former contains 4·36 grains per ounce of crystalline ferrous sulphate, and the latter 1·95 grains per ounce of the same salt. Used internally, and externally in the form of baths.

Therapeutic Indications.—Speaking broadly, these include all those morbid conditions in which iron is indicated; conditions which, as a rule, mainly depend on some degenerative or destructive changes in the blood, e.g., primary and secondary anæmias, chlorosis, and the post-febrile debility of enteric and scarlet fevers. Also for the so-called "metabolic" diseases, which chiefly consist in some digestive inefficiency, some incomplete elimination of food-toxins and other various waste products, and some defective blood formation: factors found in such diseases as gout, chronic articular rheumatism, neuritis, sciatica, and in the tardy convalescence following exhausting diseases. These waters are also useful in certain chronic skin diseases, e.g., psoriasis, eczema, acne, and impetigo. They are also suitable for the anæmia of "granular kidney," for some types of chronic catarrhal disease of mucous membranes, and for the usual forms of round-worm and tape-worm. The initial doses are small, usually from 2 or 3 teaspoonfuls to one or two tablespoonfuls gradually increased, being taken from first to last under medical supervision (*See also p.* 789).

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London, 30 miles from Hastings. Rainfall in 1911, 35·19 inches, and sunshine, 2030 hours. Mean winter temperature 41·3° F., summer 55·9° F. Lies upon a bed of sandstone. Climate is mildly tonic and invigorating. Prevailing winds W. and S.W.

Water.—Chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Diseases of respiratory organs (bronchitis, asthma, and phthisis), early cardiac cases, diseases of digestive organs, gout and rheumatoid arthritis, and especially diseases of nervous system (neurasthenia and mental depression), as well as in convalescence and infantile disorders. Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour and swimming, medicated and electric light. (*See p.* 796).

Nursing.—Mount Ephraim Nursing Home (*See p.* 788).

Hotel.—The Spa Hotel (*See p.* 796).

Woodhall Spa (Lincolnshire).—Built upon ironstone sand, through which the rain percolates very rapidly. Midway between Boston and Lincoln, about 3 hours from London (King's Cross), through carriages 4 p.m. Average rainfall 22½ inches. Air bracing, and uncontaminated, from moors and pine woods. Excellent new water supply.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; nose, throat and eye mineral sprays and douches; Russian and Berthollet vapour; electric ionic and X-ray treatments; massage and Swedish exercises. Particulars, apply Medical Superintendent. (*See also p.* 799).

Hotels.—Hotel Victoria (*See p.* 799), and Royal Hotel (*See p.* 796).

Helouan, Egypt.—Sixteen miles from Cairo by train, 200 feet above the Nile, which is about three miles from the town. Celebrated for its wonderfully dry and warm yet bracing climate, the amount of sunshine in the winter months, and its convenient position for seeing many of the antiquities of Egypt. The amount of bright sunshine from November to March averages 8·3 hours a day, as against 1·4 in London. The diurnal variations are small, the air is fresh by day and night and very free from dust. The average annual rainfall is about ¾ of an inch.

Waters.—Strong sulphur waters, which are used internally and externally in various ways, but especially in the Helouan Bath, in which massage is given while a stream of water at the desired temperature passes freely through the bath. This water rises at a temperature of 91° F.

Therapeutic indications.—Gout, rheumatism, the various forms of arthritis, fibrositis and neuritis, neurasthenia, chronic nephritis, and generally for those requiring a dry, warm climate, not relaxing, for the winter months.

Fully equipped Zander Institute, including electrical treatment and baths. (*See p.* 000.)

Hotels.—The Al Hayat Hotel and the Tewfik Palace Hotel (*See p.* 808); the Grand Hotel and Hotel Des Bains (*See p.* liv.)

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School Anatomy, of.—Handel Street, W.C.

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In order to provide for the granting of those Special Certificates of Proficiency in Vaccination which are required to be part of the Medical Qualification for entering into contracts for the performance of Public Vaccination, or for acting as deputy to a Contractor, the following arrangements are made :—

(1) The Vaccination Stations enumerated in the subjoined list are open, under certain specified conditions, for the purposes of Teaching and Examination ;

(2) The Vaccinators officiating at these Stations are authorized to give the required Certificates of Proficiency in Vaccination to persons whom they have sufficiently instructed therein ; and

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Cities and Towns having Educational Vaccination Stations.	Places used as Educational Vaccination Stations.	Vaccinators authorized to give Certificates of Proficiency in Vaccination.	Days and Hours of Attendance of the Vaccinators at Stations where periodic Courses of Instruction are given (*a*).
London ..	Westminster Hospital	A. E. Cope, M.D., [S.W. 26, Bessborough Gardens	*
	St. Thomas's Hospital		*
	Tolmers Square Institute, Drummond St., N.W.	*J. Loane, M.R.C.P.*, 13, Great Alie Street, E.	Monday ; 1
	Eastern Disp., Leman St.		Wednesday ; 11
	Christ Church Mission Hall, Shroton St., Marylebone	E. C. Greenwood, L.R.C.P., 19, St. John's Wood Park, N.W.	*
	St. Olave's and St. John's Institute, Tooley St., S.E.	V. A. Jaynes, M.R.C.S., .. 157, Jamaica Road, Bermondsey, S.E.	Wednesday; 3 (except August and September.)
	Royal Free Hospital, Gray's Inn Road, W.C.	Mrs. F. E. Willey, M.D., 1a, Devonshire Street, W.	*
Birmingham ..	144, Hockley Hill	W. H. Line, M.D., ... 144, Hockley Hill	*
Bristol ..	St. Peter's Hospital ..	*G. S. Page, L.R.C.P.*, .. 78, Old Market Street	*
Cambridge ..	Addenbrooke's Hospital ..	Dr. F. Deighton, ... Hills Road	*
Leeds ..	Leeds General Infirmary ..	Dr. A. T. Bacon, .. Westfield, Hyde Park Rd.	*
Liverpool ..	17, Mulgrave Street	*Dr. N. E. Roberts*, .. 17, Mulgrave Street	*
Manchester ..	St. Mary's Hosp., Whitworth Street West	John Scott, M.D., .. 249, Upper Brook Street	*
Newcastle ..	The Dispensary, Nelson St.	*F. Hawthorn, M.D.*, . 6, Regent Terrace	*
Sheffield ..	Jessop Hospital for Women	D. G. Newton, F.R.C.S. .. 7, Gladstone Road	*
Cardiff ..	University College	Dr. E. E Roberts, University College, Old Buildings.	*
Aberdeen ..	The Public Dispensary ..	Dr. T. Fraser, .. . 51, Elmbank Terrace	Wednesday ; 2.30 (during med sess.)
Dundee ..	Royal Infirmary	R. C. Buist, M.D., ... 166, Nethergate	Monday ; 2 (during medical session).
Edinburgh ..	New Town Dispensary	*J. B. Buist, M.D.*, 1, Clifton Terrace	Friday ; 11
	Marsball Street Dispensary		Saturday ; 11 (during med. sess.)
	Livingstone Dispensary, 39, Cowgate		Tuesday ; 3
	St. Cuthbert's Hall, Riego Street, Tolcross		Thursday ; 3
	The Royal Public Dispensary	W. G. A. Robertson, M.D., 26, Minto Street	Wed. & Sat. ; 12 (during med. sess.)
Glasgow ..	The Royal Infirmary	Dr. H. H. Borland, 41, Circus Drive, Dennistoun	Monday; 12(Women) Thursday; 12 (Men) (during med. sess.
	The Western Infirmary	J. L. Carstairs, M.A., M.B. 6, Sardinia Terrace	Mon. & Thurs. ; 12
Belfast ..	City of Belfast Union Infirm.	Dr. J. McLiesh, ... 91, Great Victoria Street	*
Cork ..	Cork District Hospital ..	W. E. A. Cummins, M.D., .. 17, St. Patrick's Place	*
Dublin ..	45, Upper Sackville Street ..	*Dr. A. N. Montgomery*, .. 45, Upper Sackville Street	Tuesday, Friday ; 10 (during med. sess.)
Galway ..	The Dispensary	Dr. M. J. McDonogh, .. Flood Street	*

(a.) Candidates for Certificates should communicate with the authorized Teacher to learn the dates of his or her regular courses of instruction. * *Days and hours arranged each Session.*

MEDICAL AND SCIENTIFIC SOCIETIES.

Abernethian Society—St. Bartholomew's Hospital, E.C.
Æsculapian Society—Secretary, 346, Kingsland Road, N.E.
Anatomical Society of Great Britain and Ireland—Secretary, Alex. Macphail, M.B., Charing Cross Hospital, London.
Association of Medical Officers of Health—Sec., D. A. Belilios, M.R.C.S., L.R.C.P., 109, Queen's Road, Wimbledon.
Association of Physicians and Surgeons, Lim. — Cranbourn Mansions, Cranbourn Street, W.C.
Association of Physicians of Great Britain and Ireland—Secretary, 40, Wimpole Street, W.
Association of Public Vaccinators of England and Wales—1, Mitre Court Buildings, E.C.
Association of Registered Medical Women—Sec., 10, Warltersville Road, N.
British Association for the Advancement of Science—Burlington House, W.
British Dental Association—Secretary, 19, Hanover Square, W.
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British Medical Association—429, Strand, W.C.
British Medical Temperance Association—Sec., 124, Harley Street, W.
British Orthopædic Society—Hon. Sec., 30, New Cavendish Street, W.
Chemical Society—Burlington House, Piccadilly, W.
Entomological Society of London—11, Chandos Street, W.
Epileptics, National Society—Sec , Denison House, Vauxhall Bridge Rd., S.W.
Epsom College (Royal Medical Foundation)—Sec., 37, Soho Square, W.
Geological Society of London—Burlington House, Piccadilly, W.
Harveian Society of London—Stafford Rooms, Tichborne Street, W.
Hospital Saturday Fund—Sec., 54, Gray's Inn Road, W.C.
Hunterian Society, The London Institution—Finsbury Circus, E.C.
Imperial Cancer Research Fund—Examination Hall, 8-11, Queen Square, W.C.
Imperial Vaccination League—53, Berners Street, W.
Incorporated Institute of Hygiene—Sec., 34, Devonshire Street, W.
Incorporated Society of Medical Officers of Health—1, Upper Montague Street, Russell Square, W.C.
King's College Medical Society—King's College Hospital, W.C.
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Linnæan Society of London—Burlington House, Piccadilly, W.
Lister Institute of Preventive Medicine—Chelsea Bridge Road, S.W.
Liverpool School of Tropical Medicine—B10, Exchange Buildings, Liverpool.
London and Counties Medical Protection Society, Lim.—32, Craven St., W.C.
London Dermatological Society—49, Leicester Spuare, W.C.
London Hospital Medical Society—Mile End, E.
Medical Defence Union, Lim.—4, Trafalgar Square, W.C.
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Medical Society of London—11, Chandos Street, W.
Medico-Legal Society—11, Chandos Street, W.
Medico-Psychological Association—Sec., 11, Chandos Street, W.
National Association for the Prevention of Consumption—20, Hanover Sq., W.
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Poor Law Medical Officers' Association—9, Copthall Avenue, E.C.
Psychical Research, Society for—20, Hanover Square, W.
Psycho-Medical Society—Sec., Spa House, Humberstone Road, Leicester.
Research Defence Society—Hon. Sec., 21, Ladbroke Square, W.
Röntgen Society—Hon. Sec., F. H Low, M.B., 13, Wimpole Street, W.

Royal Anthropological Institute—50, Great Russell Street, W.C.
Royal Astronomical Society—Burlington House, Piccadilly, W.
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Royal Institution of Great Britain—21, Albemarle Street, Piccadilly, W.
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Australasian Medical Gazette—Weekly, 6d.—Baillière, Henrietta Street, W.C.
Analyst—Monthly 2/-—Simpkin & Co., 2–8, Orange Street, Leicester Sq., W.C.
Anatomy and Physiology, Journal of—Quarterly, 21/– per annum. Chas. Griffin & Co., Lim., Exeter Street, W.C.
Annals of Surgery—Monthly 2/-—Cassell & Co. Lim., Ludgate Hill, E.C.
Bacteriology, Protozoology and General Parasitology, Review of—Six times per annum for 10/6—36-38, Whitefriars Street, E.C.
Birmingham Medical Review—Monthly 1/- ; 10/- per annum—Percival Jones, Lim., 148–149, Great Charles Street, Birmingham.
Brain—Quarterly 4/-—Macmillan & Co. Lim., St. Martin's Street, W.C.
Bristol Medico-Chirurgical Journal—Quarterly 1/6—Arrowsmith, Bristol.
British Medical Journal—Weekly 6d.—429, Strand, W.C.
British Sanatoria Annual—5/- yearly—Bale, 83-91, Great Titchfield St., W.
Burdett's Hospitals and Charities—Annually 10/6—28–29, Southampton Street, W.C.
Caledonian Medical Journal—Quarterly 1/-—A. Macdougall, Mitchell Street, Glasgow.
Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.
Chemical World—Monthly 6d.—7, Great Marlborough Street, W.
Child, The—Monthly 2/-—Bale, 83–91, Great Titchfield Street, W.
Children's Diseases, British Journal of—Monthly 2/-—Adlard & Son, 23, Bartholomew Close, E.C.

Clinical Journal—Weekly 3d.—Adlard & Son, Bartholomew Close, E.C
Dental Directory—Yearly 3/6—Bale, 83–91, Great Titchfield Street, W
Dental Journal, British—1st and 15th, 6d.—19, Hanover Square, W.
Dental Record—Monthly, 7/6 per annum—17, Newman Street, W.
Dental Science, British Journal of—1st and 15th, 6d.—Bale, 83-91, Great Titchfield Street, W.
Dental Students' Register—Annually 1/-—Constable, 10, Orange St., W.C.
Dental Surgeon—Weekly 3d., 13/– per ann.—Baillière, 8, Henrietta St., W.C.
Dental Surgeon's Daily Diary and Appointment Book—Yearly 5/–, or 6/6—Bale, 83–91, Great Titchfield Street, W.
Dentistry, Australasian Journal of—Monthly 1/-—Baillière, 8, Henrietta Street, W.C.
Dentists' Register—Annually 3/4—Constable, 10, Orange Street, W.C.
Dermatology, British Journal of—Monthly 2/-; 21/– per annum—H. K. Lewis, 136, Gower Street, W.C.
Dublin Journal of Medical Science—20/– per ann.—41, Grafton St., Dublin.
Edinburgh Medical Journal—Monthly 2/-—W. Green & Sons, Edinburgh.
Glasgow Medical Journal—Monthly 2/-—A. Macdougall, Mitchell St., Glasgow.
Guy's Hospital Gazette—Fortnightly 6d.; 7/6 per annum—Ash & Co. Lim., Henry Street, Bermondsey, S.E.
Guy's Hospital Reports—Yearly 10/6—7, Great Marlborough Street, W.
Heart: A Journal for the Study of the Circulation—Quarterly, 20/- per annum—7, Fetter Lane, E.C.
Homœopathic Journal, British—Monthly 1/-—Bale, 83–91, Great Titchfield Street, W.
Homœopathic World—Monthly 6d.—12, Warwick Lane, E.C.
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Hygiene, Journal of—Quarterly, 21/– per volume—Fetter Lane, E.C.
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Knowledge—Monthly 1/-—42, Bloomsbury Square, W.C.
Lancet—Weekly 6d.—423, Strand, W.C.
Laryngology, Rhinology, and Otology, Journal of—Monthly 2/-; 20/- per annum—Adlard & Son, 23, Bartholomew Close, E.C.
Laryngoscope, The—Monthly, 25/- per ann.—Baillière, 8, Henrietta St., W.C.
Liverpool Medico-Chirurgical Journal—Half-yearly, 2/6 each—H. K. Lewis, 136, Gower Street, W.C.
London Hospital Gazette—6/- per annum—5, Rupert Street, E.
Medical Annual—Annually 8/6—John Wright & Sons Lim., Bristol
Medical Chronicle—Monthly 1/6—University Press, Manchester
Medical Directory (Churchill's)—Annually 14/-—7, Great Marlborough St., W.
Medical Directory (Nisbet's)—Annually 8/6—Jas. Nisbet & Co. Lim., 22, Berners Street, W.
Medical Magazine—Monthly 1/-—44, Bedford Row, W.C.
Medical Officer—Weekly 4d.; 15/- per annum—36-38, Whitefriars Street, E.C.
Medical Press and Circular—Weekly 5d.; 21/– per annum—Baillière, 8, Henrietta Street, W.C.
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Medical Review—Monthly 1/6—70, Finsbury Pavement, E.C.
Medical Students' Register—Annually 2/6—Constable, 10, Orange St., W.C.
Medical Temperance Review—Quarterly 6d.—Adlard, Bartholomew Close, E.C.
Medical Times—Weekly 2d.—Basing House, Basinghall Street, E.C.
Mental Science, Journal of—Quarterly 5/-—7, Great Marlborough Street, W.
Microscopical Science, Quarterly Journal of—10/-—J. & A. Churchill, 7, Great Marlborough Street, W.
Middlesex Hospital Journal—5/- per annum—140, Wardour Street, W.
Midland Medical Journal—Monthly 4d.—128, Edmund Street, Birmingham.
Midwives' Record and Maternity Nurse—Monthly 2d.—Baillière, 8, Henrietta Street, W.C.

Midwives' Roll—Annually, 10/6—Spottiswoode & Co., 5, New Street Sq, E.C.
Mind—Quarterly 4/-—Macmillan & Co. Lim., St. Martin's Street. W.C.
National Dental Hospital Gazette—Monthly from Oct. to March, 3/- per annum—Bale, 83–91, Great Titchfield Street, W.
Nature—Weekly 6d.—Macmillan & Co. Lim., St. Martin's Street, W.C.
Neurology and Psychiatry, Review of—25/- per annum—20, South Frederick Street, Edinburgh.
New York Medical Journal—Weekly 6d.—66, West Broadway, New York.
New York Medical Record—Weekly 6d.—Wm. Wood & Co., 51, Fifth Avenue, New York
Nursing, British Journal of—Weekly 1d.—431, Oxford Street, W.C.
Nursing Mirror—Weekly, 1d.—28 and 29, Southampton Street, W.C.
Nursing Times—Weekly, 1d.—Macmillan & Co. Lim., St. Martin's St., W.C.
Obstetrics and Gynæcology of the British Empire, Journal of—Monthly 2/6—Sherratt & Hughes, 33, Soho Square, W.
Ophthalmic Hospital Reports, The Royal London—At intervals 5/-—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmic Review—Monthly 1/-—33, Soho Square, W.
Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill, 7, Great Marlborough Street, W.
Ophthalmoscope—Monthly 2/-—Pulman & Sons Lim., 24, Thayer Street, W.
Parasitology—Quarterly, 30/- per annum—Cambridge University Press, Fetter Lane, E.C.
Pathology and Bacteriology, Journal of—Quarterly, 21/- per annum—Pathological Laboratory, Medical Schools, Cambridge.
Pharmaceutical Journal—Weekly 6d.—72, Great Russell Street, W.C.
Pharmacy, Year Book of—Annually 10/-—7, Great Marlborough Street, W.
Physiology, Journal of—Quarterly, 21/- per volume—Fetter Lane, E.C.
Polyclinic—Monthly 6d.—Bale, 83–91, Great Titchfield Street, W.
Practical Dietetics and Bacterio-Therapeutics, Journal of—Monthly, 5/- per annum—Bale, 83-91, Great Titchfield Street, W.
Practitioner—Monthly 2/6; 25/- per annum—2, Howard Street, Strand, W.C.
Prescriber—Monthly 6d., 5/- per annum—137, George Street, Edinburgh.
Progressive Medicine—Quarterly 12/-—129, Shaftesbury Avenue, W.C.
Psychology, British Journal of—Quarterly 15/-—Cambridge University Press, Fetter Lane, E.C.
Public Health—Monthly 1/6—1, Upper Montague Street, W.C.
Public Health, Journal of the Royal Institute of—Monthly 2/-—63, Ludgate Hill, E.C.
Public Health Service Directory—Annually 10/6—36-38, Whitefriars St., E.C.
Quarterly Journal of Medicine—Quarterly, 8/6—Oxford University Press, Amen Corner, E.C.
R.A.M.C., Journal of the—Monthly 2/-—Bale, 83–91, Great Titchfield St., W.
Röntgen Ray, Archives of the—Monthly 1/8; 16/- per annum—Rebman Lim., 129, Shaftesbury Avenue, W.C
Röntgen Society, Journal of the—Quarterly 4/-—Smith & Ebbs Lim., Northumberland Alley, Fenchurch Street, E.C.
Royal Anthropological Institute, Journal of the—Half-yearly 15/-—50, Great Russell Street, W.C.
Royal Dental Hospital Reports—Quarterly, 5/- per annum—Bale, 83–91 Great Titchfield St., W.
Royal Microscopical Society, Journal of the—Bi-Monthly 6/-—5, Queen Victoria Street, E.C.
Royal Sanitary Institute, Journal of the—14/- per annum—12-14, Long Acre, W.C.
Royal Society of Medicine, Proceedings of the—Monthly 7/6, November to July—Longmans, Green & Co., 39, Paternoster Row, E.C.
Sanitary Record—Weekly 3d.; 14/- per ann.—55-56, Chancery Lane, W.C.
School Hygiene—Quarterly, 4/6 per annum—Adlard & Son, Bartholomew Close, E.C.

South African Medical Record—Fortnightly, 1/-; 21/- per annum—Baillière, 8, Henrietta Street, W.C.
St. Bartholomew's Hospital Journal—Monthly 6d.—St. Bartholomew's Hospital, E.C.
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St. Mary's Hospital Gazette—Monthly, 5/- per annum—187, Edgware Rd., W.
St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.
State Medicine, Journal of—Monthly, 2/—Bale, 83-91, Great Titchfield Street, W.
Surgery, Gynæcology, and Obstetrics—Monthly, 2/6; 25/- per annum—Baillière, 8, Henrietta Street, W.C.
Therapist, The—Monthly 6d.; 5/- per annum—Henderson & Spalding, Sylvan Grove, Old Kent Road, S.E.
Tropical Life—Monthly 1/-—Bale, 83–91, Great Titchfield Street, W.
Tropical Medicine and Hygiene, Journal of—Fortnightly 1/-; 18/- per annum—Bale, 83–91, Great Titchfield Street, W.
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Universal Medical Record—Monthly, 25/- per annum—36-38, Whitefriars Street, E.C.
University College Hospital Magazine—Monthly, Oct. to March, 1/—Bale, 83-91, Great Titchfield Street, W.
Vaccine Therapy, Journal of—Monthly 1/-; 10/6 per annum—H. K. Lewis, 136, Gower Street, W.C.
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Veterinary News—Weekly 2d.—Baillière, 8, Henrietta Street, W.C.
West London Medical Journal—Quarterly 1/-—23, Bartholomew Close, E.C.
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Horlick's Malted Milk Co., Slough, Bucks.
Ingram & Royle, Lim., 45, Belvedere Road, S.E. (Waters)
Liebig's Extract of Meat Co., Lim., Thames House, E.C.
Maltine Manufacturing Co. Lim., 24 & 25, Hart Street, W.C.
Mellin's Food Lim., Peckham, S.E.

Neave, J. R. & Co., Fordingbridge
Rattray, A. Dewar, 188, Dumbarton Road, Partick, Glasgow (Wines and Spirits)
Ridge's Food Co., Royal Food Mills, Boleyn Road, London, N.
Savory & Moore Lim., 143, New Bond Street, W.
Saxlehner, Andreas, Trafalgar Buildings, Charing Cross, W.C. (Mineral Waters)
Scott & Powne Lim., 10-11, Stonecutter Street, E.C.
Sumner, R. & Co. Lim., Lord Street, Liverpool
Valentine's Meat-Juice Co., Richmond, Virginia, U.S.A.
Wander, A. Lim., 1 & 3, Leonard Street, City Road, E.C.

Druggists
(Principal Wholesale).

Allen & Hanburys Lim., 37, Lombard Street, E.C.
Alliance Drug & Chemical Co., 34, Leadenhall Street, E.C.
Anglo-American Pharmaceutical Co., Lim., Croydon
Armbrecht, Nelson & Co., 71 & 73, Duke Street, W.
Bayer Co. Lim., 19, St. Dunstan's Hill, E.C.
Bishop, Alfred, Lim., 48, Spelman Street, N.E.
Blake, Sandford & Blake, 49, Dover Street, W.
British Organotherapy Co. Lim., Carlton House, Lower Regent Street, S.W.
Bullock, J. L. & Co., 3, Hanover Street, W.
Burroughs Wellcome & Co., Snow Hill Buildings, E.C.
Christy, Thos. & Co., 4, 10, & 12, Old Swan Lane, E.C.
Crown Chemical Works Lim., 63, Crutched Friars, E.C.
Denver Chemical Mfg. Co., 41, St. Ann's Road, Bow, London, E., and New York
Duncan, Flockhart & Co., 143, Farringdon Rd., E.C., & Edinburgh
Evans, Gadd & Co. Lim., Bristol and Exeter.
Evans Sons Lescher & Webb Lim., 60, Bartholomew Close, E.C., and 56, Hanover Street, Liverpool
Ferris & Co. Lim., Bristol
Formalin Hygienic Co. Lim., 3, Lloyd's Avenue, E.C.
Gale & Co. Lim., 15, Bouverie St., E.C.
Giles, Schacht & Co. Clifton, Bristol
Harris, Philip & Co. Lim., Edmund Street, Birmingham
Hewlett, C. J. & Son Lim., 35-42, Charlotte Street, E.C.
Hoffmann-La Roche Chemical Works Lim., 7 and 8, Idol Lane, E.C.
Howards & Sons Lim., Stratford, E.
Hygienic (The) Co. Lim., 36, Southwark Bridge Road, S.E.
Knoll & Co., 8, Harp Lane, E.C.
Kühn, B. & Co., 16, Rood Lane, E.C.
Macfarlan, J. F. & Co., Edinburgh, and 9 & 11, Moor Lane, E.C.
Martindale, W., 10, New Cavendish Street, W.
Meister Lucius & Brüning Lim., 3, Jewry Street, E.C.
Menley & James Lim., Menley House, Farringdon Road, E.C.
Merck, E., 66, Crutched Friars, E.C.
Newbery, F. & Sons Lim., Charterhouse Square, E.C.
Oppenheimer, Son & Co., Lim., 179, Queen Victoria Street, E.C.
Parke, Davis & Co., Beak Street, Regent Street, W.
Parker, Thos. & Co., Temple Sheen Road, East Sheen, S.W.
Phillips (Chas. H.) Chemical Co., 14, Henrietta Street, W.C.
Quibell Bros. Lim., Newark.
Reynolds & Branson Lim., 13, Briggate, Leeds
Riedel, The J. D., Co, 54, Cannon Street, E.C.
Roberts & Co., 76, New Bond Street, W.
Rogers, F. A., 327, Oxford Street, W.
S. P. Charges Co., St. Helens, Lancs.
Saccharin Corporation Lim., 10 Arthur Street West, E.C.
Savory & Moore Lim., 143, New Bond Street, W.
Southall Bros. & Barclay Lim., Birmingham
Squire & Sons, 413, Oxford Street, W.
Steele & Marsh, 6, Milsom St., Bath
Sumner, R. & Co. Lim., 50A, Lord Street, Liverpool
Symes & Co. Lim., Liverpool
Wander, A., Lim., 1 & 3, Leonard Street, City Road, E.C.
Whiffen & Sons Ltd., Battersea, S.W.
Willows, Francis, Butler & Thompson Lim., 40, Aldersgate Street, E.C.
Woolley, Jas, Sons & Co. Lim., Victoria Bridge, Manchester
Wright, Layman & Umney Lim., 48, Southwark Street, S.E.

Wulfing, A. & Co., 12, Chenies Street, W.C.
Wyleys Lim., Coventry
Zimmermann, A. & M., 3, Lloyd's Avenue, E.C.
Zimmermann, Chas. & Co., 9 & 10, St. Mary-at-Hill, E.C.

Electro-Medical, X-Ray, & Scientific Instrument Makers.

Baker, C., 244, High Holborn, W.C. (Microscopes).
Bausch & Lomb Optical Co., 19, Thavies Inn, E.C.
Cox, Harry W. & Co. Lim., 47, Gray's Inn Road, W.C.
Davidson, F. & Co., 29, Great Portland Street, W.
Leitz, E., 18, Bloomsbury Square, W.C. (Microscopes).
Mottershead & Co., 7, Exchange St., Manchester.
Newton & Wright Lim., 72, Wigmore Street, W.
Sanitas Electrical Co. Lim., 61, New Cavendish Street, W.
Schall, K. & Son, 75, New Cavendish Street, W.
Siemens Bros. & Co. Lim., Caxton House, Westminster, S.W.

Opticians.

Bausch & Lomb Optical Co., 19, Thavies Inn, E.C.
Curry & Paxton, 195–199, Great Portland Street, W.
Davidson, F. & Co., 29, Great Portland Street, W.
Newton & Wright Lim., 72, Wigmore Street, W.
Ross Lim., 111, New Bond Street, W.
Watson, W. & Sons Lim., 313, High Holborn, W.C.

Printers (Medical).

Cassell & Co., Lim. Ludgate Hill, E.C.
Wright, John & Sons Lim., Bristol

Publishers and Booksellers (Medical).

Adlard & Son, Bartholomew Close, E.C.
Appleton, D. & Co., 25, Bedford Street, Covent Garden, W.C.
Arnold, Edward, 41 & 43, Maddox Street, W.
Baillière, Tindall & Cox, 8, Henrietta Street, W.C.
Bale, John Sons & Danielsson Lim., 83-91, Great Titchfield St., W.
Cambridge University Press (C. F. Clay), 133-137, Fetter Lane, E.C.
Cassell & Co., Lim. La Belle Sauvage, Ludgate Hill, E.C. (and Printers).
Churchill, J. & A., 7, Great Marlborough Street, W.
Cornish Bros. Lim., 37, New Street, Birmingham
Fannin & Co. Lim., Grafton Street Dublin
Glaisher, H. J., 57, Wigmore St., W.
Green, Wm. & Sons, St. Giles Street, Edinburgh
Griffin, Chas. & Co. Lim., 12, Exeter Street, Strand, W.C.
Kimpton, Henry (Hirschfeld Bros. Lim.), 263, High Holborn, W.C.
Lewis, H. K., 136, Gower Street, W.C.
Lippincott, J. B. Co., 5, Henrietta Street, W.C.
Livingstone, E. & S., Teviot Place, Edinburgh
Longmans, Green & Co., 39, Paternoster Row, E.C.
Maclehose, J. & Sons, 61, St. Vincent Street, Glasgow
Macmillan & Co. Lim., St. Martin's Street, W.C.
Medical Publishing Co. Lim., 23, Bartholomew Close, E.C.
Methuen & Co. Lim., 36, Essex Street, W.C.
Murray, John, Albemarle Street, W.
Nisbet, Jas. & Co. Lim., 22, Berners Street, W.
Oxford Medical Publications (Henry Frowde and Hodder & Stoughton), 20, Warwick Square, E.C.
Rebman Limited, 129, Shaftesbury Avenue, W.C.
Saunders, W. B. Co., 9, Henrietta Street, W.C.
Scientific Press Lim., 28 and 29 Southampton Street, W.C.
Sherratt & Hughes, University Press, 34, Cross Street, Manchester
Simpkin, Marshall, Hamilton, Kent & Co. Lim., Stationers' Hall Court and Paternoster Row, E.C.
Smith, Elder & Co., 15, Waterloo Place, S.W.
Thacker, W. & Co., 2, Creed Lane, E.C. (Thacker, Spink & Co., Calcutta)
Wright, John & Sons Lim., Stone Bridge, Bristol (and Printers): London Depot, Stationers' Hall Court, E.C.

Surgical Instrument and Appliance Manufacturers.

Alexander & Fowler, 104, Pembroke Place, Liverpool
Allen & Hanburys Lim., 48, Wigmore Street,W., and Lombard St.,E.C.
Arnold & Sons, Giltspur Street, E.C.
Bailey, W. H. & Son, 38, Oxford Street, W.
Barth, Geo. & Co., 54, Poland Street, Oxford Street, W. (Inhalers).
Bridge, G. E. & Co. Lim., 128, Old Christchurch Rd., Bournemouth
Browne & Sayer, 2, Bath Street, City Road, E.C.
Clarke, John & Co. (Successors) Lim., 8, Donegall Square West, Belfast
Coles, William & Co., 5, Sackville St., Piccadilly, W. (Trusses)
Cox, Alfred & Sons, 120, New Bond Street, W.
Domen Belts Co. Lim., 456, Strand, W.C. (Belts, Trusses, etc)
Down Bros. Lim., 21 & 23, St. Thomas's Street, S.E.
Ernst, F. Gustav, 80 & 82, Charlotte Street, Fitzroy Square, W.
Fannin & Co. Lim., Grafton Street, Dublin
Ferris & Co. Lim., Bristol
Gardner, J. & Son, 32, Forrest Road, Edinburgh
Grossmith, W. R., 110, Strand, W.C.
Harris, Philip & Co. Lim., Edmund Street, Birmingham
Hawksley & Sons, 357, Oxford St., W.
Haywood, J. H. Lim., Castle Gate, Nottingham
Hearson, Chas. & Co. Lim., 235, Regent Street, W. (Incubators)
Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.
Holden Bros., 3, Harewood Place, Oxford Street, W. (Footwear)
Holland & Son, 46, South Audley Street, W. (Foot Supports)
Hospitals & General Contracts Co. Lim., 25–35, Mortimer Street,W.
Huxley, E. & Son, 13, Old Cavendish Street, W.
Krohne & Sesemann, 37, Duke Street, W.
Maw, S., Son & Sons, 7 to 12, Aldersgate Street, E.C.
Mayer & Meltzer, 71, Great Portland Street, W.
Medical Supply Association, 167–173, Gray's Inn Road, W.C.
Montague, J. H., 69, New Bond Street, W.
Mottershead & Co., 7, Exchange St., Manchester
Reynolds & Branson Lim., 13, Briggate, Leeds
Rogers, F. A., 327, Oxford Street, W.
Salt & Son Lim., 7, Cherry Street, Birmingham
Sumner, R. & Co. Lim., Lord Street, Liverpool
Surgical Manufacturing Co., 85, Mortimer Street, W.
Weiss, John & Son Lim., 287, Oxford Street, W.
Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester
Young, Archibald & Son, 57–61, Forrest Road, Edinburgh

Thermometer Manufacturers.

Zeal, G. H., 82, Turnmill Street, E.C.

Vaccine Lymph.

Government Lymph Establishment, Colindale Avenue, The Hyde, N.W. Lymph is supplied, to Public Vaccinators, free of charge, on application to the Clerk
Arents, E. (Dr. Doucet's), 48, Surrey Square, Old Kent Road, S.E.
Ferris & Co. Lim., Bristol
Jenner Institute for Calf Lymph, 73, Church Road, Battersea, S.W.
Renner's (Dr.) Establishment, 75, Upper Gloucester Place, N.W.
Roberts & Co. (Dr. Chaumier's), 76, New Bond Street, W.

NOTE BOOK.

It is easier to make a note of a thing than to remember *where* the note was made. The following pages are indexed under their respective headings, and any note can be immediately found when required.

NOTES.

Copy here any formula or fact you wish to keep for reference. (These pages are indexed under the word "Notes.")

Radium Emanation Therapy.

Apparatus for Preparing Radio-Active Water. . .
The Schmidt Electrometer for measuring Radio-Activity.

See our announcement on page xxv.

RADIUM LIMITED, 93 MORTIMER STREET, **LONDON, W.**

Telephone: Mayfair 4794.

NOTES.

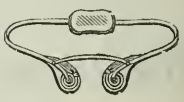
COLES' SPIRAL SPRING TRUSS.

INVENTORS AND MAKERS—

WILLIAM COLES & CO.,

5, Sackville Street, Piccadilly, LONDON, W.

(Late 225, Piccadilly, W.) *Particulars by post.*



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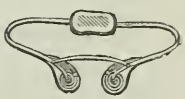
LATE 225, PICCADILLY, W.) *Particulars by post.*



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NOTES

GAUTIER FRÈRES' *ESTABLISHED* 1755.
FINE LIQUEUR BRANDY.
(20 *YEARS OLD.*) *See Advertisement, page lxxxii.*

NOTES.

RADIUM COMPRESSES.—RADIO-ACTIVE EARTH

OXYGEN BATH SALTS.

For the production of an effervescent bath liberating Oxygen "in statu nascendi" the observed effect of Oxygen is superior to CO_2.

See our announcement on page xxv.

RADIUM LIMITED, 93 MORTIMER STREET, LONDON, W.

Telegraphic Address: "Activator-Wesdo, London."

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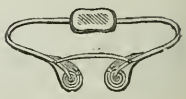

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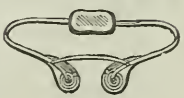

NOTES.

BISEDIA

An Elegant and Effective Preparation for GASTRO-INTESTINAL DISTURBANCE COMPLICATED WITH VOMITING.

See full announcement on page lxxi.

GILES, SCHACHT & CO., CLIFTON, BRISTOL.

INSTRUMENTS, APPLIANCES, OR MATERIALS WANTED

HORLICK'S MALTED MILK. Stands alone in a class by itself. Always ready for use. No Cooking required. Pasteurised. The ratio of protein to carbohydrate and its perfect digestibility commend it as a reliable food from Infancy to Old Age.

SEE PAGE lxxii.

Free Sample from HORLICK'S MALTED MILK CO., SLOUGH, BUCKS.

IMPORTANT TO THE MEDICAL PROFESSION.

INDEMNITY INSURANCE.

£2000—ANNUAL COST—7s. 6d.

A special arrangement has been entered into with the Medical Defence Union whereby the Yorkshire Insurance Company undertakes to indemnify members of the Union against pecuniary loss in costs and damages through adverse verdicts in actions brought against them, and taken up by the Council, to the extent of £2000 for a premium of 7/6, or £2500 for a premium of 9/-

A Form of Proposal and any further particulars desired will be immediately sent on application to any of the Company's Offices.

Points to be considered by Members of the Medical Defence Union.

(1) Members' subscriptions not increased, the Indemnity Insurance being *entirely voluntary*.

(2) Total annual cost for Subscription and £2000 Indemnity, 17s. 6d., or for £2500 Indemnity, 19s.

(3) The Indemnity is guaranteed independently of the Medical Defence Union by the above old established Company, possessing accumulated funds of over *three million sterling*.

The . . .

YORKSHIRE INSURANCE COMPANY,

Established 1824. . . . Ltd.

Chief Offices: St. Helen's Square, York. Bank Buildings, Princes St., London, E.C.

Chief Office for Scotland: 82, St. Vincent Place, Glasgow.
Chief Office for Ireland: 3, College Green, Dublin.

LONDON	
West End	55, Pall Mall, S.W.
Law Courts	222 5, Strand, W.C.
East End	43, Broadway, Stratford, E.
South West	49, Sloane Square, S.W.
South London	132, Newington Crescent, S.E.
ABERDEEN	148, Union Street,
BELFAST	6, Royal Avenue.
BIRMINGHAM	37, Bennett's Hill.
BLACKBURN	8, Richmond Terrace.
BRADFORD	2a, Tyrrel Street.
BRISTOL	2, Clare Street.
CARDIFF	32, Windsor Place.
CARLISLE	28, Castle Street.
CORK	73, South Mall.
DUBLIN	3, College Green.
DUMFRIES	10, Bank Street.
DUNDEE	20, Meadowside.
EDINBURGH	41, George Street.
GLASGOW	82, St. Vincent Street
HASTINGS	16, Havelock Road
HULL	Lowgate.
INVERNESS	62, Academy Street.
LEEDS	Infirmary Street.
LIVERPOOL	5, Fenwick Street.
MANCHESTER	3, Cross Street.
Local Director: R. J. WOOD, Esq.	
MIDDLESBROUGH	17, Albert Road.
NEWCASTLE	Bolbec Hall, Westgate Road.
NOTTINGHAM	2, King Street.
PETERBOROUGH	Priestgate.
SHEFFIELD	Market Place.
SOUTHAMPTON	8, High Street.
Local Director: JAMES T. HAMILTON, Esq.	

INDEX TO LIFE ASSURANCE OFFICES

A, *when Established*; B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50*; E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices*; P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 1912.

Title, Etc., of Office.	A	B	C	D	E
					£
Abstainers and General, Life, Fire, etc., Edmund St., Birmingham. *Act. & Sec.*, R. A. Craig A.I.A. .. .. P	1883	40/11	55 10	82/3	634,670
Alliance, Fire, Life, Marine, Accident, and Annuities, Bartholomew Lane, E.C. *Gen. Man.*, Robert Lewis .. P	1824	48/9	64 5	90/9	6,961,472
Atlas, Fire, Life, and Accident, 92, Cheapside, E.C. *Act.*, Robert Cross. *Gen. Man.*, Saml. J. Pipkin .. .. .. P	1808	49/3	63/7	88/8	2,113,217
Australian Mutual Provident Society, Life, Endowments and Annuities, 37, Threadneedle Street, E.C., *Res. Sec.*, A. C. Hollingworth. Further particulars see page 719 .. .. .. M	1849	48/2	64/5	89/10	28,490,568
Britannic Assurance Co., Ltd., Life Endowments & House Purchase, Broad Street Corner, Birmingham. *Chairman*, F. T. Jefferson, J.P. *Secretary*, J. A. Jefferson, F.I.A. Further particulars see page 718 .. .. P	1866	48/6	65/2	94/-	3,100,000
British Equitable, Life, Fire, Accident, Burglary, Employers' Liability 1, 2, 3, Queen St. Place, E.C. *Man.*, Basil May, F.I.A. P	1854	48/8	64/11	91/9	*1,709,786
Caledonian, Fire, Life, Personal Accident and All Illness, Employers' Liability, Burglary, 19, George Street, Edinburgh. *Gen. Man.*, Robert Chapman. London Offices, 82, King William Street, E.C., and 14, Waterloo Place, S.W. .. P	1805	48/9	64/6	88/6	3,036,287
Canada Life, 15, King St., Cheapside, E.C. *Man.*, A. D. Cheyne .. .. P	1847	48/9	65/10	96/8	8,101,461
City of Glasgow, Life, 30, Renfield Street, Glasgow. *Gen. Man.*, William S. Nicol. London Office, 12, King William St., E.C. *London Man.*, L. Campbell .. P	1838	48/9	64/6	89/10	3,165,576
City Life, 6, Paul Street, Finsbury, E.C. *Man. Director*, M. Gregory ..	1897	44/1	60/11	89/7	*463,385
Clergy Mutual, Life, 2 & 3, Sanctuary, Westminster. *Act. & Man.*, F. B. Wyatt. *Sec.*, W. N. Neale. Further particulars see page 717 .. .. M	1829	46/4	62/2	87/4	4,591,426
Clerical, Medical and General, Life, 15, St. James's Square, and 1, King William Street, E.C. *Act. & Sec.*, A. D. Besant P	1824	48/7	66/9	96/3	*5,468,071
Colonial Mutual, Life, Personal Sickness and Accident, and Annuity, 33, Poultry. *Man.*, Arthur E. Gibbs. *Sec.*, W. N Dewar M	1873	47/4	63/2	89/9	3,426,794
Commercial Union, Fire, Life, Marine and Accident, 24, 25, and 26, Cornhill, E.C. *Act.*, H. C. Thiselton .. .. P	1861	47/10	65/2	92/4	4,749,222
Eagle, Life, 79, Pall Mall, S.W. *Gen. Man.* Geo. R. Jellicoe; *Sec.*, J. F. E. Hall P	1807	48/7	64/5	89/10	2,124,300
Edinburgh, Life, Endowments, and Annuities, 26, George Street, Edinburgh. *Man.* T. M. Gardiner. *Sec. & Act.*, A. E. Sprague, D.Sc., F.F.A., F.I.A. London, 3, Birchin Lane, E.C. *Sec.*, J. J. Bisgood .. P	1823	47/11	64/2	90/2	4,430,399
English and Scottish Law, Life, Annuity, Endowment, and Loan, 33, St. James's Square, S.W *Gen. Man.*, Albert G. Scott. *Act. & Sec.*, John Spencer, F.I.A. P	1839	47/1	62/8	87/9	3,031,615

A, *when Established*; B, C, D, *Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50*; E, *Assurance and Annuity Funds, exclusive of Paid-up Capital.* M, *Mutual Offices*; P, *Proprietary Offices.*

Those marked with an asterisk (*) in the E column have not sent revised figures for 191-.

Title, Etc., of Office.	A	B	C	D	E
					£
Equitable Life Assurance Society, Mansion House St., E.C. *Act. & Sec.*, G. J. Lidstone M	1762	53/5	67/11	90/7	*5,241,949
Equity and Law, Life, 18, Lincoln's Inn Fields, W.C. *Act. & Sec*, W. P. Phelps, M.A., F.I.A... .. .. P	1844	48/10	64/6	90/9	4,751,328
Friends' Provident, Life, Annuities, etc., Bradford, Yorkshire. *Sec.*, William H. Gregory. *Act.*, Alfd. Moorhouse, F.I.A. M	1832	48/-	64/-	89/7	*3,429,547
General Accident, Fire and Life, Perth, Scotland. *Gen. Man.*, F. Norie-Miller, J.P. P	1885	49/2	64/11	91/3	85,609
General, Life, 103, Cannon Street, E.C. *Man. & Sec.*, John Robert Freeman. **Further particulars see page 718** P	1837	49/10	65/4	92/8	2,008,624
Gresham, Life, St. Mildred's House, E.C. *Gen. Man.*, James H. Scott .. P	1848	48/2	64/1	91/5	10,247,686
Guardian, Fire, Life, Accident, Burglary, Fidelity Guarantee, and Plate Glass, 11, Lombard Street, E.C., & 21, Fleet St. *Sec.*, T. G. C. Browne. *Act.*, Ernest Woods P	1821	48/10	64/6	89/3	4,245,245
Law Union and Rock, Life, Fire, Accident, Annuities, Burglary, etc., Old Serjeants Inn, Chancery Lane. *Gen. Man.*, Alex. Mackay .. .. .. P	1806	48/4	64/-	89/10	7,818,008
Legal & General, Life, & Annuities, 10, Fleet St, E.C. *Act. & Man.*, E. Colquhoun P	1836	50/9	65/11	90/9	8,062,541
Life Association of Scotland, 82, Princes St., Edinburgh. *Man.*, Gordon Douglas. *Sec.* R. M. M. Roddick. London Office, 28, Bishopsgate, E.C. *Sec.*, J. C. Wardrop P	1838	48/11	64/10	91/1	5,900,520
Liverpool and London and Globe, Fire, Life, Annuities, Accident, etc., 1, Dale St., Liverpool. *Gen. Man. & Sec.*, A. G. Dent. London Office, 1, Cornhill, E.C. P	1836	49/10	65/9	91/3	5,097,750
London and Lancashire, Life and General, 66 and 67, Cornhill, E.C. *Gen. Man.*, W. Æneas Mackay. *Sec.*, Louis I. Jarvis. *Jnt. Asst. Secs.*, E. E. Dent and L. C. Kestin. *Act.*, Harold Dougharty, A.I.A., F.C.I.S. .. .. .. P	1862	46/10	62/4	86/10	2,702,642
London Assurance Corporation, Fire, Life, Marine, and Accident, 7, Royal Exchange. *Man.* of Life Dept., James Clunes. *Act.*, A. G. Hemming .. .. P	1720	49/-	64/8	90/2	*2,494,655
London Life Association, Lim., 81, King William Street, E.C. *Act. & Man.*, H. M. Trouncer, M.A., F.I.A. .. M	1806	60/-	79/-	108/-	5,281,360
Marine and General Mutual, Life, and Marine, 14, Leadenhall Street, E.C. *Act. & Sec.*, S. Day, F.I.A. .. .. M	1852	48/10	65/-	91/6	1,872,245
Metropolitan Life, 13, Moorgate St., E.C. *Sec.*, Bernard Woods. *Act.*, H. J. Baker, F.I.A. .. .. .. M	1835	49/9	66/4	92/-	2,291,819
Mutual Life and Citizens', 17, Coleman Street, E.C. *Man.*, Jas. Graham, F.I.A., F.F.A. P	1886	48/9	65/3	89/9	7,603,132
Mutual Life Insurance Co. of New York, 16, 17 and 18, Cornhill, E.C. *Gen. Man.*, J. H. Harrison Hogge. *Sec.*, T. Crawford M	1843	48/9	66/-	97/-	119,014,706
National Mutual Life, 39, King Street, Cheapside, E.C. *Act. & Man.*, Geoffrey Marks, F.I.A. *Sec.*, H. J. Lockwood. *Asst. Act.*, C. R. V. Coutts, F.I.A. M	1830	48/4	63/7	89/6	3,004,291
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. *Man.*, John B. Gillison, F.I.A., F.F.A. **Further particulars see page 720** M	1869	46/8	61/6	87/2	7,000,000
National Provident, 48, Gracechurch Street, E.C. *Act. & Sec.*, L. F. Hovil M	1835	50/2	66/3	91/1	7,127,893
New York Life, Trafalgar Buildings, Trafalgar Square, London, W.C. *Sec.*, Wm. R. Collinson, F.C.I.S. .. .. .. M	1845	48/9	66/-	96/11	138,363,760

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Title, Etc., of Office.	A	B	C	D	E
					£
North British and Mercantile, Fire, Life, Annuities, 61, Threadneedle St., E.C., and 64, Princes St., Edinburgh. *Life Man. & Act.*, London, H. Cockburn. *Home Fire & Jt. Life Man.*, D. C. Haldeman. *Sec.*, R. Carmichael. West End Office, 7, Waterloo Place, S.W. *Man.*, D. C. Haworth-Booth. Further particulars see page cxiv P	1809	49/10	66/1	91/11	15,645,125
Northern Assurance, 1, Moorgate St., E.C. *Gen. Man.*, H. E. Wilson .. P	1836	49/–	64/8	90/10	5,118,045
Norwich Union, Life, Norwich. *Gen. Man. & Act.*, Davidson Walker. London Office, 50, Fleet Street, E.C.	1808	45/8	59/6	85/3	10,974,096
Pearl, Life, London Bridge, City, E.C. *Jnt. Man'g Directors*, F. D. Bowles, Esq., J.P., C.C. G. Shrubsall, J.P. .. P	1864	49/–	65/–	92/–	6,977,155
Phœnix Assurance, 19 & 70, Lombard St., 57, Charing Cross, and 187, Fleet Street, E.C. *Gen. Man.*, Sir Gerald H. Ryan, F.I.A. P	1782	48/11	64/7	90/8	*10,360,677
Provident Clerks & General Mutual Life Assurance Association, 27 & 29, Moorgate St., E.C. *Sec.*, John E. Gwyer M	1840	46/4	62/8	92/2	2,768,978
Prudential (Ordinary), Life, Holborn Bars. *Jnt. Secs.*, D. W. Stable and J. Smart. Further particulars see page 719 P	1848	49/6	65/11	91/11	43,050,370
Refuge, Life, Oxford St., Manchester. *Joint Mans.*, Philip Smith & James S. Proctor. London Office, 133, Strand, W.C. P	1864	49/3	65/9	91/9	8,000,769
Royal Exchange Assurance, Fire, Life, Annuities, etc., Royal Exchange, and 44, Pall Mall. *Act.*, H. E. Nightingale, F.I.A. P	1720	49/–	64/9	90/2	4,206,789
Royal, Fire, Life, Annuities, Accident, Marine, etc., Royal Insurance Buildings, Liverpool. *Man.*, G. Chappell. London Offices, 24-28, Lombard Street. *Sec.*, R. M'Connell P	1845	48/8	64/4	90/4	*10,306,847
Sceptre, Life and Endowments, 40, Finsbury Pavement, E.C. *Sec.*, W. E. Wright P	1864	48/8	64/8	90/6	1,202,821
Scottish Amicable, Life, St. Vincent Place, Glasgow. *Man.*, W. Hutton. *Sec.*, C. Guthrie .. .. .. M	1826	51/9	66/3	90/1	5,745,651
Scottish Equitable, Life, 28, St. Andrew Square, Edinburgh. *Man. & Act.*, G. M. Low. *Sec.*, J. J. McLauchlan. London Office, 13, Cornhill, E.C. *Sec.*, P. W. Purves. M	1831	50/–	65/5	90/6	6,029,191
Scottish Life, Life, Accident and Annuities, 19, St. Andrew Square, Edinburgh. *Man.*, Sir David Paulin, F.R.S.E. London Office, 13, Clements Lane, E.C. *Sec.*, George Struthers .. .. P	1881	49/5	64/6	90/5	1,743,671
Scottish Metropolitan, Life, Accident and Annuities, 25, St. Andrew Square, Edinburgh. *Man.*, H. E. Marriott. London Office, 8, King Street, E.C. *Man.*, C. E. M. Hudson .. .. .. P	1876	40/8	54/7	79/7	844,584
Scottish Provident, Life & Annuities, 6, St. Andrew Square, Edinburgh. *Man.*, J. G. Watson. *Sec.*, R. T. Boothby. *Joint Asst. Secs.*, C. W. Thomson & Jas. C. Lindsay. *Act.*, W. G. Walton. London Offices, 3, Lombard Street, E.C., and 17, Pall Mall, S.W. M	1837	42/4	56/6	83/2	15,077,952
Scottish Temperance, Life, Sickness & Accident, 105, St. Vincent Street, Glasgow. *Manager*, Adam K. Rodger. London, 2, 3 & 4, Cheapside. *Man.*, W. A. Bowie. *Less 10 per cent to Whole Life Abstainers* P	1883	48/6	63/9	89/10	1,804,467
Scottish Union & National, Fire, Life, Accident, Pensions, Annuities, etc., 35, St. Andrew Sq., Edinburgh. *Gen. Man.*, J. A. Cook. London Office, 5, Walbrook, E.C. *Sec.*, James G. Nicoll .. P	1824	50/6	65/6	91/–	4,982,017

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Those marked with an asterisk (*) in the E column have not sent revised figures for 1912.

Title, Etc., of Office.	A	B	C	D	E
					£
Scottish Widows' Fund, Life & Survivorship, 9, St. Andrew Square, Edinburgh. *Man. & Act.*, N. B. Gunn. *Sec.*, J. G. C. Cheyne. London Offices, 28, Cornhill, E.C., and 5, Waterloo Place, S.W. *Sec.*, R. Maclure. Further particulars see page lxxii .. .. .. M	1815	51/9	66/3	90/7	21,500,000
Standard Life, 3, George Street, Edinburgh. *Man.*, Leonard W. Dickson. London Offices, 83, King William St., and 3, Pall Mall East. *Sec.*, J. H. W. Rolland P	1825	48/11	64/5	89/–	*12,658,288
Star, Life, Annuities, Endowments, etc., 32, Moorgate Street, E.C. *Gen. Man.*, J. Douglas Watson. .. .. P	1843	49/9	66/3	93/8	*6,752,602
Sun, Life, 63, Threadneedle Street, E.C. *Act.*, R. G. Salmon, F.I.A. *Sec. & Gen. Man.*, E. Linnell .. .. P	1810	49/2	66/6	94/2	9,218,275
Sun Life of Canada, Life and Annuities, Canada House, 4 & 5, Norfolk Street, W.C. *Man.*, J. F. Junkin .. .. P	1865	48/6	65/2	94/1	8,777,758
United Kingdom Temp., etc., Life, 196, Strand, W.C. *Sec.*, H. W. Hasler M	1840	48/10	64/11	90/6	9,500,000
University, Life, 25, Pall Mall, S.W. *Act. & Sec.*, R. Todhunter, M A P	1825	49/11	65/4	91/5	933,054
Wesleyan and General, Life, Annuities, Sickness, Assurance Buildings, Steelhouse Lane, Birmingham. *Gen. Man.* A. L. Hunt. London Office, 101, Finsbury Pavement, E.C. Further particulars see page 718 .. .. .. M	1841	48/1	65/8	93/10	1,811,810
Yorkshire Insurance Co. Ltd., Chief Offices: St. Helen's Square, York. Bank Buildings, Princes Street, E.C. *Branches*, 55, Pall Mall, S.W.; 49, Sloane Square, S.W.; 222-225, Strand, W.C.; 132, Newington Crescent, S.E., 43, Broadway, Stratford, S.E. Further particulars see page 712 P	1824	49/1	64/9	91/7	2,132,762

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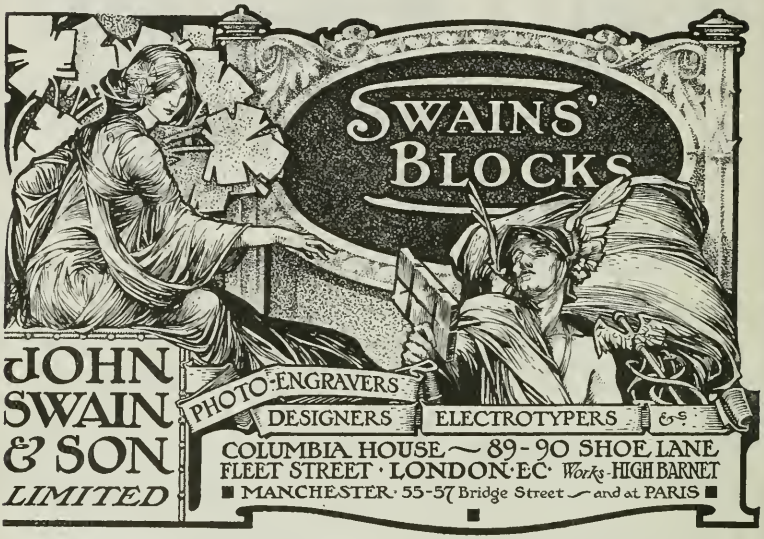

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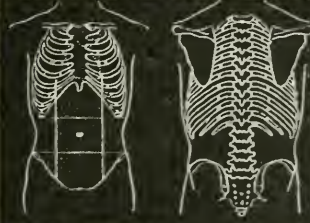

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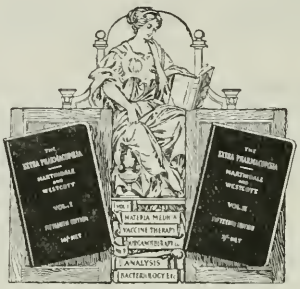

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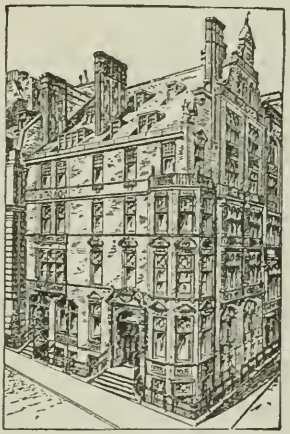

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NECESSITOUS POOR ADMITTED FREE. HOLLES STREET, DUBLIN.

Consulting Physician: Michael McHugh, M.B., Phys. to St. Vincent's Hosp.; *Consulting Surgeon:* Sir T. Myles, M.D., F.R.C.S., Surg. to H.M. the King in Ireland; *Physician:* C. M. O'Brien, M.D., Hon. Member of Dermatological Society, France; Fellow of Medical Society, London; *Surgeon and Pathologist:* T. T. O'Farrell, F.R.C.S.; *Secretary:* F. Scott, 3 Holles Street.

THIS Hospital is the first and only one in the City exclusively devoted to the practice and treatment of Skin Diseases. Senior Students are admitted free to the practice of the Hospital, which has a large Out-Patient attendance, with 15 beds for Intern cases. The Sixth Annual Post-Graduate Course of this Hospital terminated on October 12th, 1912.

WESTMINSTER HOSPITAL MEDICAL SCHOOL
(UNIVERSITY OF LONDON).

The SECOND WINTER TERM begins on January 9, and the SUMMER SESSION on April 17.

COURSES OF STUDY.—Full Curriculum for the Preliminary, Intermediate, and Final Examinations of the University of London and of the Conjoint Examining Board of the Royal Colleges of Physicians and Surgeons.

FEES.—Annual Composition Fee, **25 Guineas,** which includes the subscription to the Football, Cricket, and various other Clubs and Societies included in the Clubs' Union. Special terms are given to the sons of medical men.

ENTRANCE SCHOLARSHIPS.—The following Scholarships may be competed for during the year :

One, of **£40,** in Chemistry and Physics -	in April.
Two, of **£50** each, in Anatomy and Physiology	
One in Arts, of the value of **£60** - - -	in May.
Two in Science (**£60** and **£30**) - - -	in July.
Two, of **£50** each, in Anatomy and Physiology -	in September.

The April Scholarships are open to students entering for the Summer session, and the others to those prepared to enter in October. Those in Anatomy and Physiology are open to students of any University in the United Kingdom or British Dominions.

HOSPITAL APPOINTMENTS.—All Students are provided with Clerkships and Dresserships, and are at once eligible, when they have passed the Final Examination, for the posts of House Physician, House Surgeon, and Resident Obstetric Assistant. Unrivalled opportunities are afforded for holding these appointments.

For further particulars apply to—
D. W. CARMALT JONES, M.A., M.D., B.Ch.Oxon., M.R.C.P., Dean.

Richmond, Whitworth and Hardwicke Hospitals, DUBLIN.

THE SESSION 1912-13 commenced on October 1st, 1912. These Hospitals for Surgical, Medical, and Fever Cases respectively, contain nearly 300 beds.

Physicians: Doctors O'Carroll, Coleman, and Travers-Smith. **Assistant Physicians:** Doctors Matson, Purser, and Nesbitt.
Surgeons: Sir Thomas Myles, Mr. R. J. Harvey, Mr. Conway Dyer. **Assistant Surgeons:** Mr. Slattery, Mr. McConnell, Mr. Crawford.
X Rayist: Dr. E. J. M. Watson.
Ophthalmic Surgeon: Mr. Joyce. **Gynæcologist:** Dr. Gibson.
Laryngologist: Dr. Gogarty. **Pathologist:** Dr. Earl.
Anæsthetist: Dr. Boyd. **Dentist:** Mr. Bradley.

Unqualified resident clinical clerks are appointed quarterly from any recognised school of medicine.

For Particulars apply :
R. TRAVERS-SMITH, M.D., 20 Lower Fitzwilliam Street, Dublin, *Hon. Sec. and Treasurer.*

Established 1900.

PRIVATE NURSING ASSOCIATION, Ltd.
Radford Road, ROYAL LEAMINGTON SPA.

Patron : THE RIGHT HON. LORD LEIGH.

Certificated Hospital-trained Nurses for Medical, Surgical, Maternity, Massage, Fever and Mental Cases sent any distance. Surgical, Medical and Maternity Home: Patients received. Chronic and Convalescent Cases taken.

For Terms apply: MRS. JAMES WARD, M.I.H.

ST. ANDREWS UNIVERSITY

FACULTY OF MEDICINE.

THE SESSION 1912-13, commenced OCTOBER 14th, 1912.

The whole Curriculum may be taken in Dundee, or the first two years of the Course may be taken in St. Andrews, and the remaining three years in the Conjoint School of Medicine, University College, Dundee. The various Laboratories are fully equipped for teaching and for research.

CLINICAL INSTRUCTION is given at the Dundee Royal Infirmary, which has 400 beds, with special wards for Maternity cases, Diseases of Women, Diseases of Children, Diseases of the Eye, Diseases of the Ear, Throat, and Nose, Diseases of the Skin, Cancer, Incipient Insanity, and for cases requiring electrical treatment. Further instruction in Diseases of the Eye is given at the Dundee Eye Institution, which is attended by over 4000 patients annually. Clinical Instruction in Fevers is given at the Municipal Fever Hospital; and clinical instruction in Mental Diseases at the Dundee District Asylum, which has about 400 resident patients.

APPOINTMENTS.—Six Resident Medical Assistants, and an Outdoor Obstetric Assistant, are appointed annually at the Dundee Royal Infirmary. At the District Asylum the appointments include two qualified Resident Medical Assistants and two Resident Clinical Assistants.

BURSARIES.—At United College, St. Andrews, two Malcolm Medical Bursaries of the annual value of £25 and tenable for five years, are open to men or women. Nine Taylour-Thomson Medical Bursaries of the annual value of £15 to £25, are limited to women. At University College, Dundee, twelve Entrance Bursaries of the value of £15 each, and fourteen Second and Third Year's Bursaries of the value of £20 and £15, are open to competition. Two Fourth and two Fifth Year's Bursaries of £20 each are open to Students who take the Complete Curriculum in University College. Other Bursaries, of which the patronage is vested in trustees, are available.

THE FEES for the Complete Course, exclusive of Examination Fees, amount to about £130. For further information, apply to the Secretary, at St. Andrews, or to

PROFESSOR KYNOCH, *Dean.*

CONJOINT SCHOOL OF MEDICINE, DUNDEE, *October*, 1912.

UNIVERSITY COLLEGE OF SOUTH WALES and MONMOUTHSHIRE, CARDIFF.

(A Constituent College of the University of Wales.)

FACULTY OF MEDICINE.

Students may spend at least three out of the five years of their medical study at this College. The courses of instruction given are recognised as qualifying for the Examinations of the Universities, Royal Colleges, and other licensing bodies of Great Britain and Ireland. Medical men preparing for a Diploma in Public Health and Hygiene can attend complete courses of instruction in these subjects. All classes are open to Women Students. The composition fee for students preparing for the first and second examinations in Medicine of the University of London is £63. The composition fee for the classes qualifying for the first and second examinations of the Conjoint Board is £41 10s. The composition fee for the D.P.H. Course is £30. Hospital instruction may be taken at King Edward VII's Hospital, which is situated within three minutes' walk of the College. A course of Lectures to Midwives adapted to the requirements of the Central Midwives Board, under the Midwives Act, was commenced in October, 1904. The Lectures are suitable both for Pupil-Midwives and Practising-Midwives as well as for Nurses who desire to enter for the Examination for Certification under the Act. A prospectus containing all information regarding classes, fees and entrance scholarships may be obtained by application to the Registrar of the College.

Physics..Prof. A. L. Selby, M.A., assisted by J. H. Shaxby, B.Sc., A.R.C.S., and D. E. Thomas, M.A., B.Sc.
Chemistry..Prof. C. M. Thompson, M.A., D.Sc., F.C.S., assisted by Assist.-Prof. E. P. Perman, D.Sc., F.C.S., and Robert D. Abell, D.Sc., Ph.D., F.I.C., F.C.S.
Zoology..Prof. W. N. Parker, Ph.D., F.Z.S., assisted by T. H. Burlend, M.A., B.Sc.
Botany..Prof. A. H. Trow, D.Sc., F.L.S., assisted by M. Y. Orr
Anatomy. Prof. David Hepburn, V.D., M.D., C.M., F.R.S. Ed., assisted by D. Leighton Davies, M.D., M.S. (Lond.), F.R.C.S., & Jas. O. D. Wade, M.B., L.R.C.P., M.R.C.S.
Physiological Chemistry—M. H. Renall, B.Sc.
Physiology..Prof. John Berry Haycraft, M.D., D.Sc., F.R.S.E., assisted by M. H. Renall, B.Sc.
Histology and Embryology..Harold A. Haig, M.B., B.S.
Materia Medica & Pharmacology..W. Mitchell Stevens, M.D., M.R.C.P.
Pathology and Bacteriology.. Prof. E. Emrys-Roberts, M.D., M.B., Ch.B.
Materia Medica—W. Mitchell Stevens, M.D., M.R.C.P., M.R.C.S.
Vaccination—E. Emrys-Roberts, M.D., M.B., Ch.B.
Public Health and Hygiene..Edward Walford, M.D., D.P.H., and D. J. Morgan, M.A., M.D., D.P.H.
Hygienic Chemistry..J. H. Sugden, M.Sc., F.I.C.
Midwifery (for Midwives)..E. J. Maclean, M.D., M.R.C.P.

THE REGISTRAR OF THE COLLEGE. F.R.S.E.
DAVID HEPBURN, V.D., M.D., C.M., F.R.S.E., Dean of the Faculty of Medicine.

Royal College of Surgeons of Edinburgh

FOUNDED 1505.

Copies of the Regulations for the Fellowship, Licence, and Licence in Dental Surgery, with dates of Examinations, Curricula, etc., for the year 1913, are now ready, and may be had on application to—

D. L. EADIE, 54, GEORGE SQUARE, EDINBURGH, *Clerk to the College.*

The Hospital for Sick Children

GREAT ORMOND STREET, W.C.

Clinical Instruction is given daily by Members of the Visiting Staff in the Wards, Out-patient Department, Operating Theatre and Post-mortem Room.

Clinical Clerkships in the Wards and Clinical Assistantships in the Out-patient Department are also available for Students and Post-Graduates.

During each Session, Lectures are given at 4 p.m. on Thursday afternoons by Members of the Staff.

Fees for Hospital Attendances:—One Month's Ticket, **£2 2s.** Three Months' Ticket, **£5 5s.** Perpetual Ticket, **£10 10s.**

Special Reduced Fee for Clinical Clerks for 3 months, **£1 1s.**

On Tuesdays and Fridays, from 5.15 to 6.15, a special Course of Instruction in the Surgical Diseases of Children is given throughout the year. Fee for 8 attendances, **£1 1s.**

Pathological Clerkships.—Facilities are afforded for obtaining Theoretical and Practical Instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees:—For 1 month, **£3 3s.** For 2 months, **£5 5s.** For 3 months, **£6 6s.**

A reduction is made in the case of those already holding tickets for general attendance at the Hospital.

From time to time special courses of instruction in the Medical and Surgical Diseases of Children are given extending over a period of three weeks. Further particulars may be obtained from the Secretary or the Dean.

Signed, **GEORGE E. WAUGH, F.R.C.S.,** *Dean to the Medical School.*

University Examination Postal Institution.

Offices: 17, RED LION SQUARE, HOLBORN, LONDON, W.C.

Manager: MR. E. S. WEYMOUTH, M.A. (Lond.)

POSTAL or ORAL PREPARATION for ALL MEDICAL EXAMINATIONS.

SOME RECENT SUCCESSES.

M.D. (Lond.), 1901–12: **191,** including **9 Gold Medallists.** (16 out of 17 passed in 1911.)
M.S. (Lond.), 1902–12: **14,** including **3 Gold Medallists.**
Second Medical (Lond.): **28.**
M.B., B.S. (Lond.), 1909–12: **31,** besides others who have only tried one group as yet.
M.R.C.P. (Lond.), during 1910–12: **11.**
D.P.H., 1906–12: **98.** Laboratory Work always in progress.
F.R.C.S. (Eng., Edin., Irel.): **33.** **F.R.C.S.** (Eng.), Nov. 1912 Exam.: **6.**
PRIMARY F.R.C.S. (Eng.), 1907–12: **28.**
R.A.M.C. Entrance, Jan. 1912: **3** placed.
Promotion to **Major, R.A.M.C.,** 1906–12: **22.** No failures for this examination.
CONJOINT FINAL, 1911–12: **13** (besides **8** who tried part only).
M.D. Brux., 1910–12: **13,** including several with distinction.
M.D. Durham: Of the last 13 candidates, **11** succeeded.
M.D. (Thesis): Numerous successes at various Universities. Legitimate assistance.

N.B.—There are different modes of counting "successes." The figures given do **not** include successes gained by private pupils of the Tutors. List of 20 years' successes sent on application.

UNIVERSITY of BRISTOL.

FACULTY OF MEDICINE.

The University affords complete courses of instruction for its own examinations, those of the University of London, and those of the Conjoint Board, etc., for Medical Degrees or Diplomas. The Dental and Public Health Departments afford the necessary instruction for the Degrees and Diplomas of the University and of other examining bodies in those subjects.

The University confers the following Degrees and Diplomas :—

Bachelor of Medicine and Bachelor of Surgery	M.B., Ch.B.
Doctor of Medicine	M.D.
Master of Surgery	Ch.M.
Bachelor of Dental Surgery	B.D.S.
Master of Dental Surgery	M.D.S.
Licentiateship of Dental Surgery	L.D.S.
Diploma in Public Health	D.P.H.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. that the Medical student may without much loss of time take also the degree of B.Sc. Moreover, the Dental student may in seven years take both Dental and Medical degrees. Magnificent Physiological and Chemical departments have recently been opened, and new laboratories have been provided for Mechanical Dentistry and Dental Metallurgy. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by a skilled mechanic.

CLINICAL WORK is done at the Bristol Royal Infirmary, and the Bristol General Hospital, which together contain over 400 beds. The Bristol Royal Hospital for Sick Children and Women, the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

SCHOLARSHIPS.— There is no entrance scholarship, but students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the City Scholarship Committee.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification.

At the Bristol Royal Infirmary.—Two House Surgeons, two House Physicians (of these one is chosen as Senior Resident Officer), one Resident Obstetric Officer, one Throat, Nose and Ear House Surgeon, one Ophthalmic House Surgeon, one Casualty Officer, and one Dental House Surgeon.

At the Bristol General Hospital.—One Senior House Surgeon, one Casualty House Surgeon, two House Physicians, one House Surgeon, and one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the Dean of the Medical Faculty or the Registrar.

UNIVERSITY OF DURHAM

COLLEGE OF MEDICINE, NEWCASTLE-ON-TYNE.

DEGREES IN MEDICINE, SURGERY AND HYGIENE; DIPLOMAS IN PUBLIC HEALTH AND PSYCHIATRY, AND LICENCE IN DENTAL SURGERY.—Six Degrees, two Diplomas, and one Licence are conferred by the University of Durham—*viz.*, the Degrees of Bachelor of Medicine, Doctor of Medicine, Bachelor of Surgery, and Master of Surgery; Bachelor of Hygiene, and Doctor of Hygiene; the Diplomas in Public Health and Psychiatry, and the Licence in Dental Surgery. These Degrees, etc., are open to Men and Women.

Attendance at the University of Durham College of Medicine during one of the five years of professional study, or subsequently to qualification elsewhere, is required as part of the curriculum for the Degrees, except in the case of Practitioners of more than fifteen years' standing, who have attained the age of forty years, who can obtain the Degree of M.D. after examination only.

The first three Examinations for the Degree of M.B. may be passed prior to the commencement of attendance at Newcastle.

A candidate who has passed the First and Second Examinations of the University will be exempt from the First and Second Examinations of the Conjoint Board in England, and will be entitled to present himself for the Final Examination of the Board on the completion of the necessary curriculum. Students who have satisfied the requirements of the General Medical Council as regards Registration, in some Examination other than the Durham Matriculation, or its equivalent, may enter on a course of study for a degree in Medicine upon satisfying the Examiners of the University of Durham in *three* of the subjects of the Matriculation Examination (exclusive of Religious Instruction and Elementary Mathematics), provided that one of them is a language other than English. In the case of a Student who spends only one year at Newcastle, the necessary subjects of the Matriculation Examination must be passed at least 12 months previously to the candidate's entry for his Final Examination for the Degree.

Students can complete, at the University of Durham College of Medicine, Newcastle-upon-Tyne, the entire course of professional study required for the above degrees and for the Diplomas in Public Health and Psychiatry; also for the examinations of the Royal Colleges of Physicians and Surgeons, and for the Army and Navy Examination Boards.

A Dental curriculum is provided, and a Licence in Dental Surgery may be obtained after Examination.

All information, together with Examination Papers, etc., is given in the Calendar of the University of Durham College of Medicine, Newcastle-on-Tyne, which may be obtained gratis from the Secretary at the College.

Scholarships, &c.—University of Durham Scholarship, value £100 for proficiency in Arts awarded annually to full students in their first year only. The Pears Scholarship value £150—for proficiency in Arts. Dickinson Scholarship—value the interest of £400, and a Gold Medal—for Medicine, Surgery, Midwifery, and Pathology. Tulloch Scholarship—value the interest of £400—for Anatomy, Physiology, and Chemistry. Charlton Scholarship—value the interest of £700—for Medicine. Gibb Scholarship—value the interest of £500—for Pathology. Luke Armstrong Scholarship—interest on £680—for comparative Pathology. Stephen Scott Scholarship—interest on £1000—for promoting the study of Surgery and allied subjects. Heath Scholarship—the late George Yeoman Heath, M.D., M.B., D.C.L., F.R.C.S., President of the University of Durham College of Medicine, bequeathed the sum of £4000 to found a Scholarship in Surgery, the interest to be awarded every second year. Gibson Prize—value the interest of £225—for Midwifery and Diseases of Women and Children. The Turnbull Prize and Medal—for Surface Anatomy. The Goyder Memorial Scholarship (at the Infirmary)—value the interest of £325—for Clinical Medicine and Clinical Surgery. At the end of each Session, a Prize of Books is awarded in each of the regular Classes. Assistant Demonstrators of Anatomy, Prosectors, and Assistant Physiologists are elected yearly. Pathological Assistants, Assistants to the Dental Surgeon, Assistants in the Eye Department, Clinical Clerks and Dressers are appointed every three months.

The Royal Victoria Infirmary contains over 400 beds. Clinical Lectures are delivered by the Physicians and Surgeons in rotation. Pathological Demonstrations are given as opportunity offers, by the Pathologist; Practical Midwifery can be studied at the Newcastle Maternity Hospital, where there is an out-door practice of over 1000 cases annually.

FEES.

(*a*) A Composition Ticket for Lectures at the College may be obtained—

I.—By payment of 72 guineas on entrance.

II.—By payment of 46 guineas at the commencement of the First Year, and 36 guineas at the commencement of the Second Year.

III.—By three annual instalments of 36, 31, and 20 guineas respectively, at the commencement of the Sessional year.

(*b*) Fees for attendance on Hospital Practice:—

For 3 Months' Medical and Surgical Practice, £6 6s. For 6 months', £10 10s. For 1 year's, £15 15s. For Perpetual, £36 15s.

Or by two instalments—First year, 20 guineas; Second year, 18 guineas.

In addition to the above fees, the Committee of the Royal Victoria Infirmary require the payment of 2 guineas yearly up to three years from every Student attending the Infirmary for a year or part of a year. After three years of attendance, such payment will be no longer necessary.

(*c*) Single courses of Lectures, 5 guineas.

(*d*) A Composition Ticket for the courses of Lectures and Practical work of the first two years of the curriculum, may be obtained by the payment of 40 guineas on entrance.

(*e*) Composition fee for Lectures, etc., at College for Licence in Dental Surgery, 34 guineas; Composition fee for Practical work at Dental Hospital, 35 guineas.

(*f*) Composition fee for courses of instruction for the Diploma in Psychiatry, 25 guineas.

Fees for Lectures, etc., at the College must be paid to the Secretary. Fees for Hospital Practice to Dr. W. E. HUME, and fees for Practical Dental Work to the Dean of the Dental Hospital—at the time of entry.

Further particulars may be obtained from the Sec., PROF. HOWDEN, at the College.

UNIVERSITY OF EDINBURGH.

SESSION 1912-13.

Principal—Sir WILLIAM TURNER, K.C.B., D.C.L., LL.D., D.Sc., M.B.

The WINTER SESSION opens on the 8th of October and closes 19th March, The SUMMER SESSION opens on 15th April and closes 27th June.

FACULTY OF MEDICINE.

Dean—Professor HARVEY LITTLEJOHN, M.A., B.Sc., M.B., C.M.

The Faculty embraces thirteen Chairs and over twenty Lectureships; and attached to these Chairs there are about thirty assistants and Demonstrators. Instruction is given in all the main branches of Medical Science, viz.,

PROFESSORS.

Chemistry—James Walker, D.Sc., F.R.S.
Zoology—J. Cossar Ewart, M.D.
Botany—Isaac Bayley Balfour, M.D., D.Sc.
Anatomy—Arthur Robinson, M.D., C.M.
Physiology—E. A. Schäfer, LL.D.
Materia Medica—Sir Thomas R. Fraser, M.D. LL.D.
Pathology—J. Lorrain Smith, M.D.
Forensic Medicine—Harvey Littlejohn, M.B., B.Sc.
Public Health—C. Hunter Stewart, M.B., D.Sc.
Medicine—John Wyllie, M.D., LL.D.
Surgery—Alexis Thomson, M.D., C.M., B.Sc.
Midwifery—Sir J. Halliday Croom, M.D.
Clinical Surgery—Francis Mitchell Caird, M.B., C.M.
Clinical Medicine—Sir Thomas R. Fraser, M.D. John Wyllie, M.D.

UNIVERSITY LECTURERS.

Mental Diseases—George M. Robertson, M.B., C.M.
Diseases of the Eye—George Mackay, M.D.
Systematic and Clinical Gynæcology—A. H. F. Barbour, M.A., M.D.
Clinical Instruction on Diseases of Children—G. H. Melville Dunlop, M.D., and Staff of Royal Hospital for Sick Children.
Embryology and Vertebrate Zoology—J. Beard, D.Sc.
Anatomy—E. B. Jamieson, M.D.
Applied Anatomy—Harold J. Stiles, M.B., C.M.
Histology—Harold Pringle, M.D.
Physiological Chemistry—W. Cramer, Ph.D., D.Sc.
Experimental Physiology—John Tait, M.D., D.Sc.
Experimental Pharmacology—W. C. Sillar, M.D., B.Sc.
Physics—C. G. Knott, M.A., D.Sc.
Pathological Bacteriology—W. E. Carnegie Dickson, M.D., B.Sc.
Diseases of the Larynx, Ear and Nose—A. Logan Turner, M.D.
Tropical Diseases—D. G. Marshall, Major, I.M.S.
Medical Entomology, and Protozoology—J. H. Ashworth, D.Sc.
Tropical Hygiene—J. B. Young, M.B., D.Sc., conjointly with Professor.
Diseases of the Skin—Norman Walker, M.D.
Clinical Instruction in Infectious Fevers—Alexander James, M.D.; Claude B. Ker, M.D.
Practical Anæsthetics—D. C. A. McAllum, M.B., C.M.
History of Medicine—J. D. Comrie, M.A., B.Sc., M.D.
Neurology—J. J. Graham Brown, M.D.
Physical Methods—Harry Rainy, M.A., M.D.

Practical Instruction is afforded, under the superintendence of the Professors, in Laboratories with the necessary appliances, and in Tutorial and Practical Classes connected with the above Chairs, and opportunities are afforded to Students and Graduates to extend their practical knowledge and engage in original research.

Opportunities for Hospital Practice are afforded at the Royal Infirmary, the Hospital for Sick Children, Maternity Hospital, the City Fever Hospital, and Asylum for the Insane. Upwards of 2,106 beds are available for the Clinical Instruction of Students of the University.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh, viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.); and a Diploma in Tropical Medicine and Hygiene is conferred on Graduates in Medicine and Surgery of the University. A Diploma in Psychiatry is also conferred on registered Medical Practitioners.

The minimum Class Fees for M.B. and Ch.B., including Hospital Fee (£12), amount to about £115, and the Matriculation and Examination Fees to £28 7s. An additional Fee of £15 15s. is payable by those who proceed to M.D., and £15 15s. by those who proceed to Ch.M.

The Annual value of the Bursaries, Prizes, Scholarships, and Fellowships in the Faculty of Medicine amounts to about £3,600, and that of the other Bursaries, etc., tenable by students of Medicine, amounts to about £1,820.

Instruction is also given in Public Health, and the Degrees of B.Sc. and D.Sc. in Public Health are conferred by the University.

Residences for Students, Graduates and others, situated within easy reach of the University, afford excellent board and lodgings on very moderate terms.

A Syllabus and further information as to Matriculation, the Curricula of Study for Degrees, etc., may be obtained from the Dean of the Faculty of Medicine, and for Degrees in the Faculties of Arts, Science, Divinity, Law and Music, from the Deans of these Faculties; or from the Clerk of Senatus; and full details are given in the University Calendar, published by James Thin, 55, South Bridge, Edinburgh. Price by post, 3s. 6d.

The Preliminary and Degree Examination Papers in each of the Faculties are also published by Mr. James Thin—viz., Arts and Science Preliminary Papers and Bursary Papers, 1s.; Medical Preliminary Papers, 6d.; Degree Papers—Arts, 1s.; Science, 9d.; Divinity, Law, Medicine, and Music, 6d. each.

By Authority of the Senatus,

October, 1912. L. J. GRANT, *Secretary of Senatus.*

ROYAL INFIRMARY, EDINBURGH.

IN this Hospital (with 921 beds and 42 cots) a portion of the beds is set apart for Clinical Instruction by the Professors of the University of Edinburgh. Courses of Clinical Medicine and Surgery are also given by the Ordinary Physicians and Surgeons. Three wards are specially set apart for the instruction of Women Students. Special Instruction is given in the Medical Department on the Diseases of Women, Physical Diagnosis, and Diseases of the Skin; and in the Surgical Department on Diseases of the Eye, the Ear, and the Larynx. Separate Wards are devoted to Venereal Diseases, Diseases of Women, and Diseases of the Eye, the Ear and Throat, and the Skin; also to cases of Incidental Delirium or Insanity. Post-mortem Examinations are conducted in the Anatomical Theatre by the Pathologist, who also gives Practical Instruction in Pathological Anatomy and Histology.

MEDICAL DEPARTMENT.

Consulting Physicians—Sir J. O. Affleck, Dr. Alexander James, Dr. Byrom Bramwell, Emeritus Professor W. S. Greenfield.
Consulting Gynæcologist—Professor Sir John Halliday Croom, Emeritus Professor Sir A. R. Simpson.
Consulting Physician for Diseases of the Skin—Dr. W. Allan Jamieson.
Professors of Clinical Medicine—Sir T. R. Fraser, Dr. John Wyllie, (one vacancy).
Ordinary Physicians and Lecturers on Clinical Medicine—Dr. Geo. A. Gibson; Dr. R. W. Philip; Dr. William Russell; Dr. G. Lovell Gulland; Dr. J. J. Graham Brown.
Gynæcologists—Dr. A. H. F. Barbour; Mr. N. T. Brewis.
Physicians for Diseases of the Skin—Dr. Norman Walker; Dr. Frederick Gardiner.
Assistant Physicians—Dr. Francis D. Boyd; Dr. R. A. Fleming; Dr. Harry Rainy; Dr. Chalmers Watson; Dr. Edwin Bramwell; Dr. Edwin Matthew; Dr. W. T. Ritchie; Dr. John Eason.
Assistant Gynæcologists—Dr. J. Haig Ferguson; Dr. William Fordyce.
Assistant Physicians for Diseases of the Skin—Dr. R. Cranston Low.
Extra Medical Electrician—Dr. Dawson Turner.
Medical Electricians—Dr. Hope Fowler; Dr. Archd. McKendrick.

SURGICAL DEPARTMENT.

Consulting Surgeons—Mr. A. G. Miller; Dr. C. W. MacGillivray; Emeritus Professor John Chiene, C.B.; Mr. J. M. Cotterill.
Consulting Ophthalmic Surgeon—Mr. Geo. A. Berry.
Consulting Aural Surgeons—Dr. P. M'Bride; Dr. M'Kenzie Johnston.
Consulting Dental Surgeon—Mr. William Guy.
Regius Professor of Clinical Surgery—Mr. Caird.
Professor of Surgery—Mr. Alexis Thomson.
Ordinary Surgeons—Mr. C. W. Cathcart; Mr. Hodsdon; Mr. David Wallace; Mr. Alexander Miles; Mr. John W. Dowden.
Ophthalmic Surgeons—Dr. George Mackay; Dr. Wm. George Sym.
Surgeons to Ear and Throat Department—Dr. A. Logan Turner; Dr. J. Malcolm Farquharson.
Dental Surgeon—Mr. J. H. Gibbs.
Assistant Surgeons—Mr. A. A. Scot Skirving; Mr. Geo. L. Chiene; Mr. W. J. Stuart; Mr. J. W. Struthers; Mr. Henry Wade; Mr. E. Scott Carmichael; Mr. D. P. D. Wilkie.
Assistant Ophthalmic Surgeons—Dr. J. V. Paterson; Dr. A. H. H. Sinclair.
Assistant Surgeons to Ear and Throat Department—Dr. John A. Fraser; Dr. John D. Lithgow.
Pathologist—Dr. Theodore Shennan.
Assistant Pathologists—Dr. James Miller; Dr. A. Murray Drennan; Dr. D. Murray Lyon.
Superintendent—Lieut.-Col. Sir Joseph Fayrer, Bart., M.D., F.R.C.S.E.

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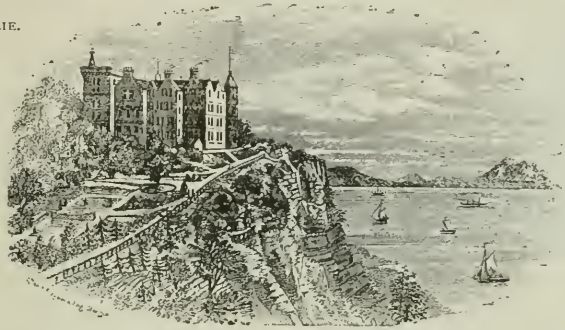

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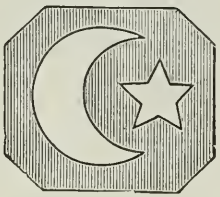

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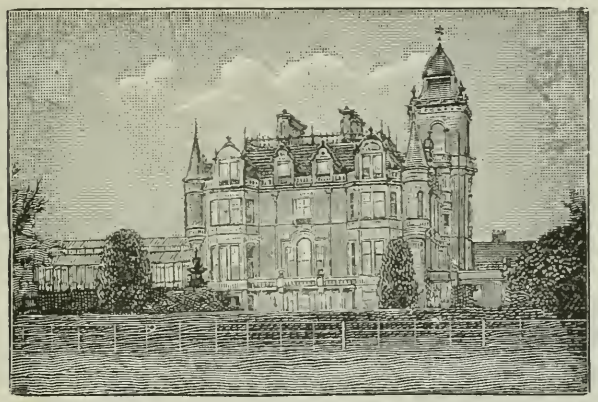

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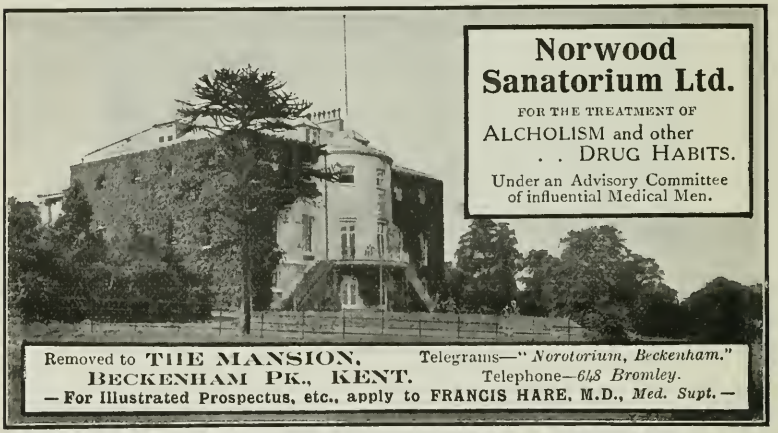
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TERMS MODERATE - Apply MEDICAL SUPERINTENDENT.

The Licensees have also a Private Residence at Llandudno, North Wales, for the treatment of mild borderland and convalescent patients.

Dr. STANLEY GILL and Dr. HAYES GILL may be consulted at 30, RODNEY STREET, LIVERPOOL, from 2 0 till 4.0 p.m. every Monday and Thursday.

BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

Ladies and Gentlemen MENTALLY AFFLICTED,

—— is now conducted by his son, ——

E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by Mrs. SANKEY.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 70 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, motor, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

Letters and Telegrams should be addressed to—

DR. SANKEY, Boreatton Park, BASCHURCH, SALOP.

THE RETREAT, YORK.

ESTABLISHED 1792.

A Registered Hospital for the Treatment of Mental Diseases.

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the **Upper and Middle Classes,** and none are paupers or rate-aided. **Terms from 48.- weekly.**

Voluntary Boarders are received on their own application.

For further particulars see the Annual Report, which will be sent on application to Dr. BEDFORD PIERCE, the Medical Superintendent. *Nat. Telephone :* 112 **York.**

THROXENBY HALL, Near SCARBOROUGH.

A Branch House connected with The Retreat, York, situated near the Raincliffe Woods, about two miles from Scarborough, for the reception of **Convalescent Patients,** also for the treatment of persons suffering from **Incipient or Mild Forms of Mental Disorder** who cannot be certified as of unsound mind, and who wish voluntarily to place themselves under skilled treatment.—For further particulars apply to the Matron, or to Dr. BEDFORD PIERCE, at THE RETREAT, YORK. *Nat. Telephone :* **282 Scarborough.**

RETREAT TRAINED NURSES DEPARTMENT.

Staffed by Nurses who have been trained for four years in the Retreat, and conducted upon a profit-sharing basis. MENTAL and NERVOUS CASES only undertaken.

TRAINED MALE NURSES are also available.
TERMS : £2 8s. 0d. Weekly.

TERMS: **2 guineas** Weekly.
Apply MATRON, Retreat, York. Nat Tel. 112

Croydon Mental Hospital,

UPPER WARLINGHAM, SURREY.

SALUBRIOUSLY SITUATED AT 650 FEET ABOVE SEA LEVEL.

PAYING PATIENTS RECEIVED.

Nat. Telephone: 1410 Croydon.

Apply to the Medical Superintendent.

BETHEL HOSPITAL, NORWICH

ESTABLISHED A.D. 1713.

THIS Institution is an endowed Hospital, registered under the Lunacy Acts, and managed by a Board of Governors who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients.

The Hospital is arranged for both sexes, and is especially adapted for those whose means will not permit of their being sent to an expensive and luxurious Institution for the Insane, and who may object to the associations of a pauper asylum.

The terms for admission are **thirty shillings per week, or more,** according to Patients' condition and circumstances, which includes everything, except clothing, carriage exercise, or any expenses incurred for amusement beyond the Hospital grounds.

CONSULTING PHYSICIAN:
SAMUEL J. BARTON, Esq., M.D.
(Senior Physician to the Norfolk and Norwich Hospital).

RESIDENT MEDICAL SUPERINTENDENT:
SAVILLE J. FIELDING, M.B.

CLERK TO THE GOVERNORS:
FRANCIS HORNOR, QUEEN STREET, NORWICH.

MATRON:
MISS OXLEY *(Late Sister Guy's Hospital, London).*

APPLICATION FOR ADMISSION TO BE MADE TO THE
Resident Medical Superintendent, BETHEL HOSPITAL, NORWICH.

COTON HILL
HOSPITAL FOR THE INSANE,

NEAR STAFFORD.

Chairman of the Committee of Management—
THE RIGHT HONOURABLE THE EARL OF DARTMOUTH.

THIS HOSPITAL, which is beautifully situated in a high and healthy position, with extensive grounds, Cricket Field, Lawn Tennis Courts, Golf Links, etc., is devoted to the CARE AND TREATMENT OF THE MENTALLY AFFLICTED OF THE UPPER AND MIDDLE CLASSES.

PRIVATE ROOMS with Special Attendants in the Hospital, or semi-detached Villas in the grounds, can be arranged. **Terms on application.**

For further particulars apply to R. W. HEWSON, L.R.C.P. & S. Ed. (Ed. Univ.) Med. Supt.

The RETREAT,
LANCASTER.

A HOME FOR PRIVATE PATIENTS in a detached Villa, in connection with the County Asylum at Lancaster, but apart from the pauper department.

Terms from 21/- per week, without extras.

APPLY TO THE MEDICAL SUPERINTENDENT.

SPRINGFIELD HOUSE

NEAR BEDFORD.

(TELEPHONE No. 17. **Within an hour of London by Midland.**)

AN INSTITUTION FOR THE

CARE AND CURE OF THE INSANE.

Under the Personal Direction of the Licensees:

DAVID BOWER, M.D.

(Late Resident Medical Superintendent of Saughton Hall Asylum Edinburgh;)

MR. W. S. BOWER AND MISS BELLARS,

(ASSISTED BY LADIES' AND GENTLEMEN'S COMPANIONS.)

DR. BOWER attends at 5, Duchess Street, Portland Place, W., on Tuesdays, from 4 to 5.

Ordinary Terms = Three Guineas per week.

Including separate bedrooms for all suitable cases.

Vacancies are advertised each week in the *British Medical Journal* and the *Lancet.*

The Lawn, Lincoln.

A REGISTERED HOSPITAL FOR MENTAL DISEASES, situated in the City of Lincoln, near to the Cathedral.

FOR TERMS, APPLY TO

DR. RUSSELL, *Resident Medical Superintendent.*

HERRISON,

DORCHESTER ASYLUM.

This **Home for Private Patients** is delightfully situated, with all modern conveniences for the treatment of the Insane. Terms on application to the MEDICAL SUPERINTENDENT, Herrison, Dorchester.

Telegrams: "HERRISON, CHARMINSTER."

East Sussex County Asylum

HELLINGLY MENTAL HOSPITAL.

ACCOMMODATION is provided for PRIVATE PATIENTS in the Hospital at £1 4s. 6d. per week, and in addition two wards of the Main Building have been set aside for the same purpose, at a reduced charge of One Guinea per week for each person from the Administrative County of East Sussex, and £1 2s. 9d. for each person from outside the County, to include all things necessary except clothing.

The main and detached building of this new Institution have been built on the most modern principles, and everything possible has been done to ensure the comfort and cure of those mentally afflicted.

The estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for Children.

For particulars apply to the MEDICAL SUPERINTENDENT.

Telegrams: "ENVOY, FINSQUARE, LONDON." Telephone: 5608 Central.

ST. LUKE'S HOSPITAL

For Mental Diseases,

ESTABLISHED 1751. ⚜ **OLD STREET, LONDON.**

ADMISSION on payments up to 42/- per week. In certain circumstances Patients are received gratuitously.

Convalescent Establishment at **St. Lawrence-on-Sea, Thanet.**

Country Convalescent Establishment, near Gerrards Cross, Bucks, standing in 130 acres of Park, Ornamental Gardens, and Grounds. ::

VOLUNTARY BOARDERS ARE RECEIVED AT THE :: HOSPITAL AND CONVALESCENT HOMES. ::

TRAINED NURSES supplied from the Private Nursing Staff for nursing Mental and Nervous cases at their own homes.

Full particulars on application to the Secretary at the Hospital. ⚜ **W. H. BAIRD, Secretary.**

Established 1826.

PECKHAM HOUSE

112, PECKHAM ROAD, LONDON, S.E.

Telegrams: "Alleviated, London." Telephone: 1576 Hop.

An Institution licensed for the CARE and TREATMENT of the MENTALLY AFFLICTED of Both Sexes. Conveniently situated. Electric trams and omnibuses from the Bridges and West-End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday parties sent to the Seaside branch at Worthing during Summer months.

— Moderate Terms:—

Apply to MEDICAL SUPERINTENDENT for further particulars.

ISLE OF WIGHT ASYLUM.

LADY PRIVATE PATIENTS.

A DETACHED Residence for Lady Private Patients is now in occupation in connection with this County Asylum.

The building is beautifully situated in the centre of the island, in a warm and healthy climate, and fitted with the electric light and other modern conveniences.

Provision is made for amusement by dances, concerts, etc., and for employment and treatment.

TERMS:—from 21/- WEEKLY.

Appy to the Medical Superintendent:—

WHITECROFT, CARISBROOKE, ISLE OF WIGHT.

BETHLEM ROYAL HOSPITAL,

LAMBETH ROAD, LONDON, S.E.

LADIES AND GENTLEMEN of the Educated Classes, suffering from NERVOUS OR MENTAL DISORDERS of short duration, are received for treatment at a fixed fee of **2 guineas** a week. Voluntary Boarders are also received.

Medical Supt.: Dr. W. H. B. STODDART, F.R.C.P.

To whom all applications should be addressed.

CONVALESCENT HOME at WITLEY, SURREY.

Incorporated by Royal Charter.

James Murray's Royal Asylum, Perth.

Chairman—**The Rt. Hon. The Earl of Mansfield.**

THIS Asylum, for Private Patients only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The Main Building has been entirely re-organized and enlarged by the addition of *two wings*, for the reception of acute cases, so as to render it an efficient *Hospital* as well as a comfortable *Home*.

The Mansion-House of PITCULLEN, SEVEN GABLES, Elie, and THE EAST AND WEST VILLAS, afford the necessary variety of accommodation for modern treatment. Consumptive Patients are separately treated in Sanatoria.

National Telephone Company: No. 104, Perth.

Postal and Telegraphic Address: Dr. Urquhart, Perth.

CAMBERWELL HOUSE

33, Peckham Road, LONDON, S.E.

Telephone: No. Hop. 1037. Telegrams: "PSYCHOLIA, LONDON."

For the Care and Treatment of those of Both Sexes suffering from NERVOUS and MENTAL DISORDERS.

CONSISTS of separate Houses, completely modernised, and standing in 20 acres of picturesque grounds, including cricket field, tennis courts, and croquet lawns. The Terrace Houses are quite separate from the rest of the Institution, and are specially adapted for the reception of Mild and Borderland Cases, who can enter voluntarily. The ordinary Terms are **2 guineas** per week.

Patients paying higher fees can have separate sitting and bedrooms, with a special nurse, as well as the use of the general rooms.

HOVE VILLA, BRIGHTON.—A CONVALESCENT HOME in connection with Camberwell House for suitable MENTAL & NERVOUS PATIENTS of both sexes.

For further particulars apply to the MEDICAL SUPERINTENDENT at the above address.

ESTABLISHED 1814.

NORTHUMBERLAND HOUSE,

GREEN LANES, FINSBURY PARK, N.

Telephone No : 888 North. Telegrams: "Subsidiary," London.

An INSTITUTION for the Care and Treatment of Ladies and Gentlemen suffering from Nervous and Mental Affections.

Four miles from Charing Cross; nearest Station, Finsbury Park (G.N. and N. London Railways); Tubes to City and West End. Electric Cars from Finsbury Park Station run every few minutes past the gates.

Six acres of ground, highly situated, facing Finsbury Park.

Private Villas, in suites of rooms.

Voluntary Boarders received without certificates.

Seaside branch at Worthing.

For terms and other particulars apply to RESIDENT PHYSICIAN.

ASHWOOD HOUSE,

KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

Railway Stations: Stourbridge Junction (G.W.R.), 3½ miles; Dudley (L. & N.W.R.), 4 miles, Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles. Intending visitors can be met at any of these Stations.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

CRANBOURNE HALL

GROUVILLE, JERSEY.

MENTAL AND INEBRIATES' HOME FOR LADIES AND GENTLEMEN.

Medical Superintendent—**A. C. STAMBERG, M.D.**

Old established, and delightfully situated in the most healthy and picturesque locality in the Island. Voluntary Boarders received without certificates. **Terms—2 to 6 Guineas a week.**

For further particulars apply to—

MISS TAYLOR, *Lady Superintendent and Licensee*,
or to the **Medical Superintendent.**

BARNWOOD HOUSE,
GLOUCESTER.

A REGISTERED HOSPITAL for PRIVATE PATIENTS Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort, and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres.

For terms, etc., apply to JAS. GREIG SOUTAR, M.B., C.M.,
TELEPHONE No. 307. *Resident Superintendent.*

PLYMPTON HOUSE,
PLYMPTON, SOUTH DEVON
ESTABLISHED 1834.

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the medical treatment and care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.

The proprietors, Dr. ALFRED TURNER and Dr. J. C. NIXON, have had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under their charge—is guaranteed.

TERMS ON APPLICATION. *Letters and Telegrams:*
Telephone: No. 2 PLYMPTON. DR. TURNER, PLYMPTON.

OTTO HOUSE,
47, North End Road, West Kensington, W.
Telephone: No. 1004 Hammersmith

A HOME FOR THE CARE AND TREATMENT OF LADIES MENTALLY AFFLICTED.

Apply to Mrs. CHAPMAN (Resident Lady Superintendent), or to A. H. SUTHERLAND (Licensed Propr.), 2a Marloes Road, Kensington, W.

NEWLANDS HOUSE,
Telephone: No. 524 Streatham. **Tooting Bec Common, London, S.W.**

A small PRIVATE HOME for the Care & Treatment of a limited number of GENTLEMEN suffering from NERVOUS or MENTAL BREAKDOWN.

For Terms and Particulars apply to DR. J. NOEL SERGEANT,
PROPRIETOR AND RESIDENT PHYSICIAN.

THE WARNEFORD,

HEADINGTON HILL, OXFORD.

A Registered Hospital for the Care and Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders.

President—THE RIGHT HON. THE EARL OF JERSEY.
Chairman of the Committee—
THE REV. WILLIAM ARCHIBALD SPOONER, D.D., Warden of New College, Oxford.
Vice-Chairman—SURGEON-GENERAL SIR A. FREDERICK BRADSHAW, M.A., K.C.B.

The Regular Charge for Patients is £2 2s. a week, but the Committee have power to alter the charges at their discretion, as the circumstances of cases require.

The building is arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

The Hospital possesses an Endowment Fund, arising from numerous grants of the late Dr. SAMUEL WILSON WARNEFORD and others. When a reduction of the ordinary charge is asked, a special statement of the circumstances of the Patient must accompany the application for Admission.

For further particulars, apply to the Medical Superintendent, JAMES NEIL, M.D.

THE GRANGE, Near ROTHERHAM,

A SANATORIUM OF THE HIGHEST CLASS FOR THE

CARE & CURE OF MENTAL INVALIDS (LADIES).

Consulting Physician: CROCHLEY CLAPHAM, M.D., F.R.C.P.E.
Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.
Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)

GRANGE LANE STATION (M. S. & L. Railway) is within a quarter of a mile of The Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

FOR TERMS, FORMS, &C., APPLY TO THE RESIDENT PHYSICIAN.

NORTHWOODS HOUSE,

WINTERBOURNE, near BRISTOL.

A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.

Situated in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

Voluntary Boarders received without Certificates.

For further information, see London Medical Directory, p. 2067, and for Terms, etc., apply to Dr. EAGER, or Dr. J. D. THOMAS, Resident Medical Proprietors, Northwoods House.

Dr. EAGER *or* Dr. THOMAS *attends at* 64, *PARK STREET, BRISTOL, on Mondays and Thursdays, from* 12 *to* 3 *o'clock.*
TELEPHONE NO. 18 WINTERBOURNE.

HOLLOWAY SANATORIUM,
VIRGINIA WATER.

A Registered Hospital for the CURE and CARE of the INSANE and of NERVOUS INVALIDS of the MIDDLE and UPPER CLASSES.

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted. There is a branch establishment at Canford Cliffs, Bournemouth, where Patients and Boarders can be sent for a change, and provided with all the comforts of a well-appointed home.

For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.

The SILVER BIRCHES, Church Street, EPSOM.

This Home has been established over 60 years for the Care and Treatment of Ladies suffering from Mental Ailments.

TERMS, Etc., on application to—
MISS M. O. DANIEL, *Res. Licensee*, or to Dr. E. C. DANIEL, *Co-Licensee.*
Telephone: 346 P.O. Epsom.

BETHNALL HOUSE ASYLUM,
Cambridge Road, LONDON, N.E.
FOR THE INSANE OF BOTH SEXES.

—— *Terms on application.* ——
J. KENNEDY WILL, M.A., M.D., Resident Medical Superintendent.

City of London Mental Hospital,

Under the management of a Committee of the Corporation of the City of London. ✲ **Near DARTFORD, KENT.**

Private Patients are received at the inclusive rate of One Guinea per week and upwards. An illustrated booklet giving full particulars can be obtained from the Medical Superintendent. The institution is within two miles of Dartford Station on the S. E. Railway, and is about 16 miles from London.

CLARENCE LODGE,
CLARENCE ROAD, CLAPHAM PARK.

A limited number of **LADIES** suffering from **MENTAL** and **NERVOUS DISORDERS** are received for treatment under a specialist. The house stands in large grounds.

For further Particulars see Illustrated Prospectus from the Proprietress,
Telephone: 494 Brixton. **MRS. THWAITES, B.A.**

PRIVATE ASYLUMS.
CO. DUBLIN.

HAMPSTEAD, Glasnevin, for Gentlemen. | HIGHFIELD, Drumcondra, for Ladies.

For the Cure and Care of Patients of the Upper Class suffering from Mental and Nervous Diseases and the Abuse of Drugs.

Telephone No. 1032. Telegrams: "Eustace," Glasnevin.

These Hospitals are built on the Villa System, and there are also Cottages on the demesne (154 acres), which is 150 ft. above the sea level and commands an extensive view of the Dublin Mountains and Bay.

Voluntary Patients admitted without Medical Certificate.

For further information apply for illustrated prospectus, etc., to the Resident Medical Superintendents: DR. HENRY MARCUS EUSTACE, Highfield, Drumcondra, or DR. WILLIAM NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41, Grafton Street, Dublin. Telephone 198. On Mondays, Wednesdays, and Fridays, from 2 to 3 p.m.

THE ROYAL ALBERT INSTITUTION
LANCASTER.

THE ROYAL ALBERT INSTITUTION is a Home for the Care, Education and Training of the IMPROVABLE FEEBLE-MINDED, with accommodation for 750 cases.

Terms: 1. FREE PATIENTS, between the ages of Six and Fifteen, whose friends cannot meet the lowest payment of 25 Guineas per annum.

2. PAYING PATIENTS **admitted by the Central Committee without Election and at any time.** The charges vary from 25 to 200 Guineas per annum.

BRUNTON HOUSE (For Private Pupils).

BRUNTON HOUSE combines the comforts of a Private Home with all the advantages of a large Public Institution under responsible management. It possesses extensive gardens and grounds which include tennis and croquet lawns. Individual attention is given to the pupils by an experienced Staff, under a Resident Physician and Lady Matron. SAMUEL KEIR, *General Secretary*.

THE MOAT HOUSE, TAMWORTH, STAFFORDSHIRE.

STATIONS: L. & N. WEST. and MID. RAILWAYS.

A HOME FOR NERVOUS AND MENTAL CASES.

The House stands in grounds of ten acres (within 5 minutes drive of either Station), and is devoted to the care and treatment of a few Ladies suffering from Nervous and Mental Disorders, who enjoy the comforts, privacy, and occupations of home-life. Voluntary Patients received.

For terms, etc., apply to the Resident Proprietor,

E. HOLLINS, M.A. Camb.

DERBY BOROUGH ASYLUM.
FEMALE PRIVATE PATIENTS.

A SEPARATE and DETACHED BLOCK has just been opened. Terms: **One Guinea per week,** which includes everything except clothing. This building is distinct from the main Asylum, and has separate recreation grounds.

For further particulars, apply to the Medical Superintendent.

Dr. S. R. MACPHAIL, Rowditch, DERBY.

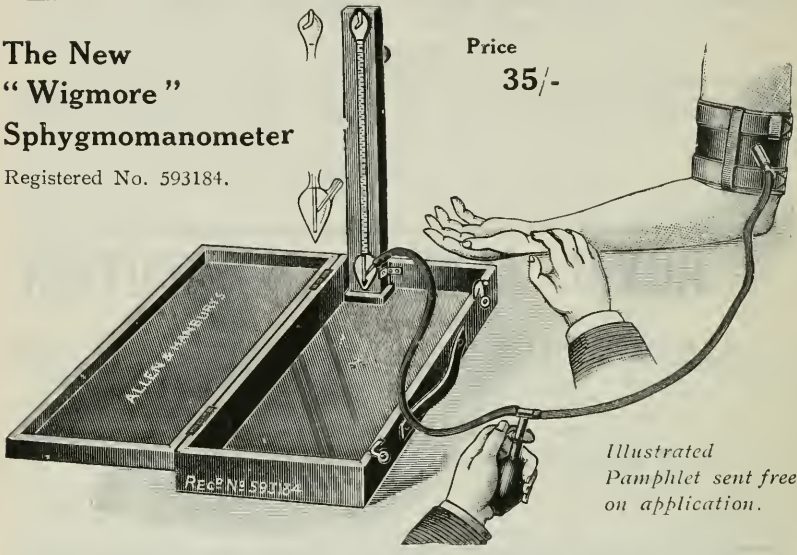
ALLEN & HANBURYS Ltd.

Manufacturers of Surgical Instruments and Aseptic Furniture.

The New "Wigmore" Sphygmomanometer

Registered No. 593184.

Price 35/-

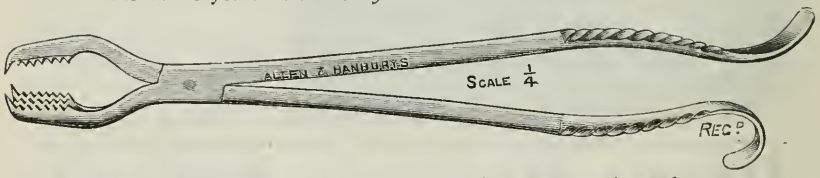


Illustrated Pamphlet sent free on application.

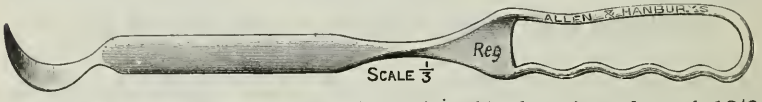
THIS Instrument is the latest and most improved pattern, its advantages being as follows: it is always fitted up ready for use; it is impossible to spill the Mercury; the scale can be read off immediately, the mercurial column giving the exact systolic pressure.

Arbuthnot Lane's Instruments For the Operative Treatment of Fractures.

As made for Mr. Lane by ALLEN & HANBURYS Ltd.



Bone Holding Forceps, Lane's, latest improved pattern, *registered*,
length 17½ in. ... ... each **42/-**
Ditto ditto ditto length 12 in. ... ... ,, **32/6**



Bone Elevator, Lane's, Retractor and Guard combined, *registered* each **12/6**

A Fully Illustrated Catalogue of Surgical Instruments sent free on application.

48, Wigmore St., London, W.

ALLEN & HANBURYS Ltd.

Manufacturers of Surgical Instruments and Aseptic Furniture.

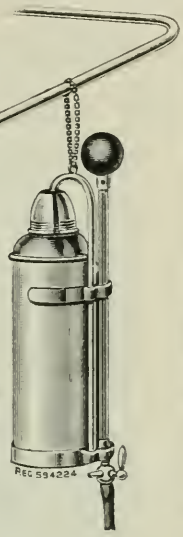
Souttar's "Thermos" Saline Infusion Apparatus.

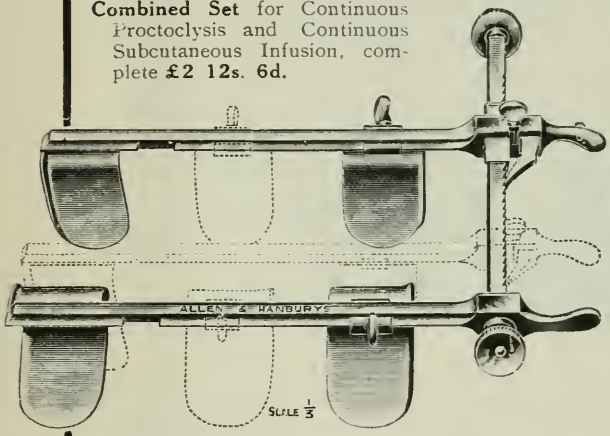
No. 1 Set for Continuous Proctoclysis, complete **£2 5s.**

No. 2 Set for Continuous Subcutaneous Infusion, complete **£2 4s.**

Combined Set for Continuous Proctoclysis and Continuous Subcutaneous Infusion, complete **£2 12s. 6d.**

Illustrated Pamphlet sent Free on Application.





Retractor.

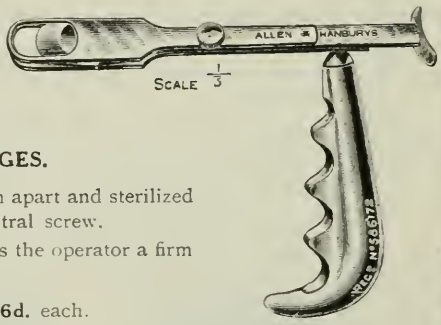
COMYNS BERKELEY'S

(Registered)

For Wertheim's and General Abdominal Operations, **£2 5s.**

Aseptic Tonsil Guillotine

(Registered Pattern).



ADVANTAGES.

1.—The whole can be taken apart and sterilized by unscrewing the central screw.

2.—The special handle gives the operator a firm grip and great power.

Price **£1 5s. 6d.** each.

48, Wigmore St., London, W.

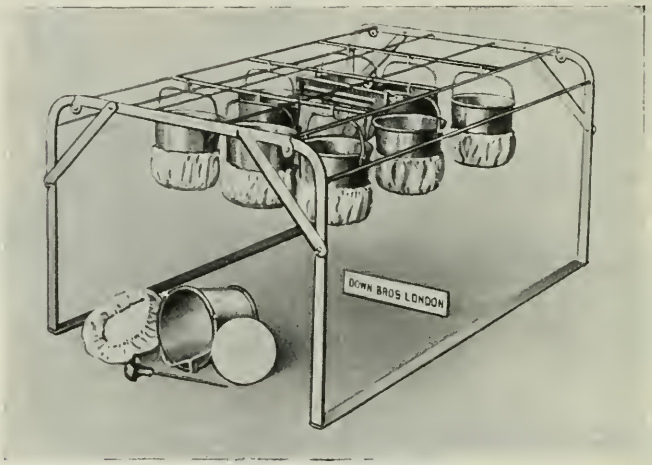
DOWN BROS.' SPECIALITIES

AN IMPROVED ICE-CRADLE

(Patent Applied for).

For the Reduction of Temperatures in Enteric Fever, etc.

Suggested by MISS K. C. BRAIDWOOD,
Matron of the Infectious Hospital, Mylands, Colchester.



To the framework is attached a set of 8 ice-pails with strainers and flannel covers, and a thermometer. The flannel covers, by absorbing the moisture due to condensation, effectually prevent dripping. The temperature recorded by the cradle-thermometer is noted each time the patient's temperature is taken; as the latter decreases, one or more pails can be removed, so that the patient does not get chilled.

The advantages claimed for the apparatus are :—

1. Convenience in carriage and storage; the cradle folds flat when not in use.
2. Avoidance of all discomfort to the patient, who also need not be moved.
3. Saving of time and labour, as compared with that involved in the use of baths, packs, etc,
4. The apparatus can be easily managed by one nurse.

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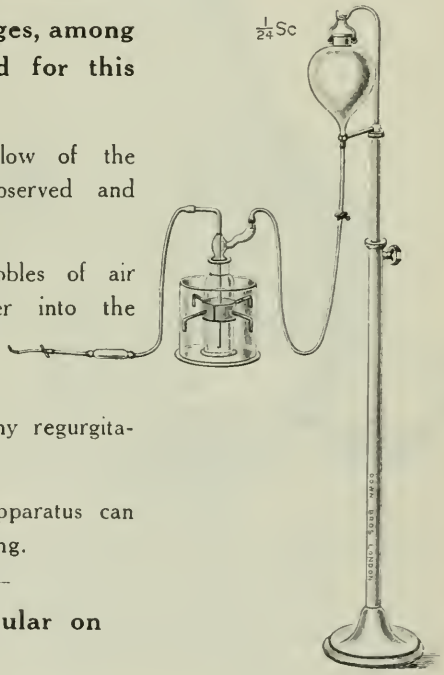
Apparatus for Intravenous Anaesthesia, Ether, Hedonal, &c.

Suggested by MR. E. G. SCHLESINGER, M.B., B.S.
(*Vide* "Guy's Hospital Gazette," May 25th, 1912.)

The following advantages, among others, are claimed for this apparatus :—

1. The exact rate of flow of the solution can be observed and controlled.
2. The admission of bubbles of air or evaporated ether into the circulation is prevented.
3. Warning is given of any regurgitation of blood.
4. Asepsis : the whole apparatus can be sterilized by boiling.



Full descriptive circular on application.

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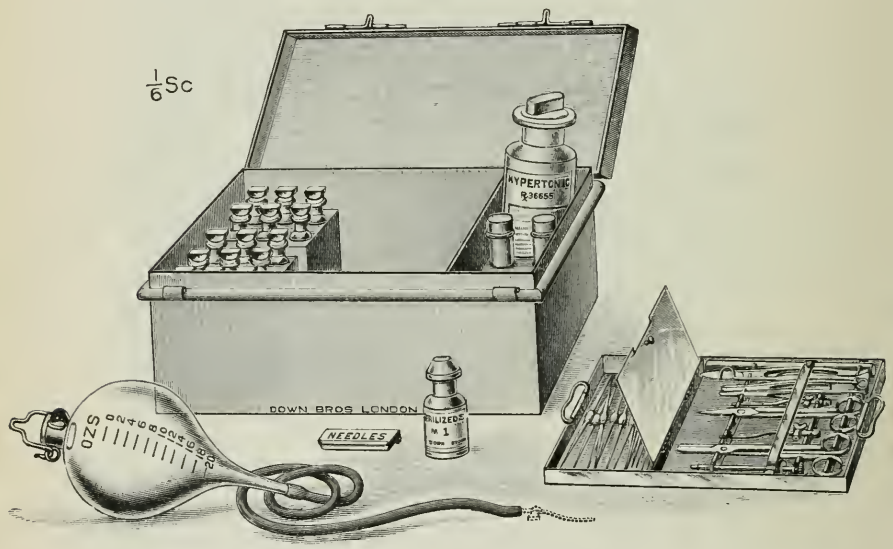
Suggested by MAJOR LEONARD ROGERS, I.M.S.,

For Injecting Hypertonic Saline Solution in Cholera Collapse and Infantile Diarrhœa ; also useful for Post-operative Infusions, etc.



Consisting of Saline Infusion Apparatus with two Silver Intravenous Cannulæ and one Abdominal Cannula, Scalpel, Aneurysm Needle, Scissors, Artery Forceps, Rat-tooth Forceps, Dissecting Forceps, Needles, Sterile Silk, Thermometer, Saline Soloids, Tablets for making Hypertonic Solutions, and set of 15 Bottles engraved 1044 to 1072, for taking Specific Gravities ; conveniently arranged in a neat japanned case.

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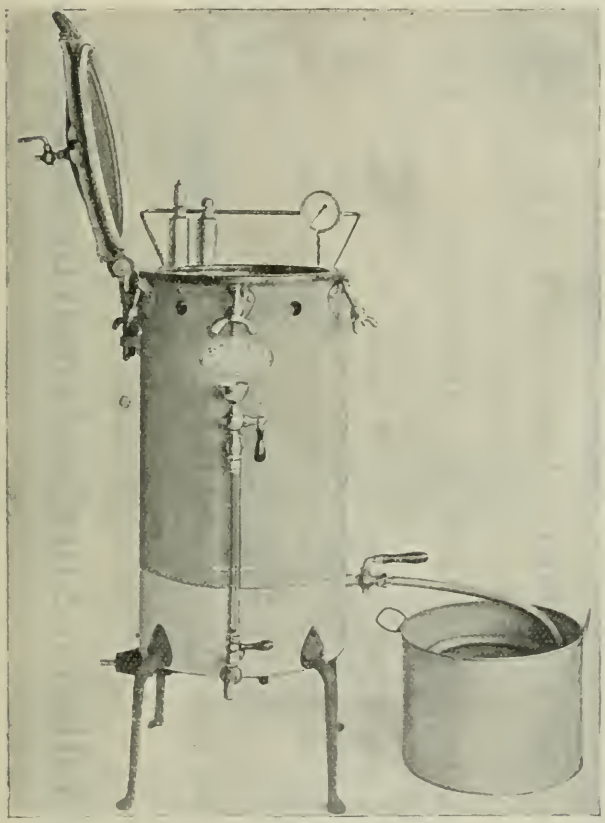

These apparatus, which are of the highest quality and best manufacture, are fitted with safety valve to blow off at 6 lbs. pressure, thus ensuring a continuous pressure inside the apparatus of over 5 lbs.; there is also a second safety valve with whistle blowing off at 8 lbs., as a precaution in case of the apparatus reaching a higher pressure when left unattended.

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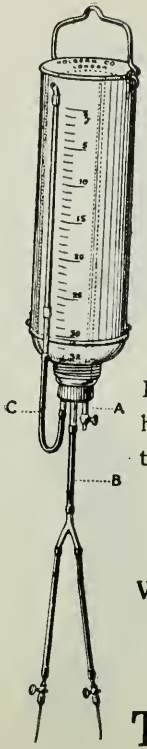

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(Subcutaneous).

Suggested by N. STUART CARRUTHERS, M.R.C.S. Eng., L.R.C.P. London.

Vide B. M. J., 30th Sept., 1911.—"The Inefficiency of the present method of Saline Infusion."

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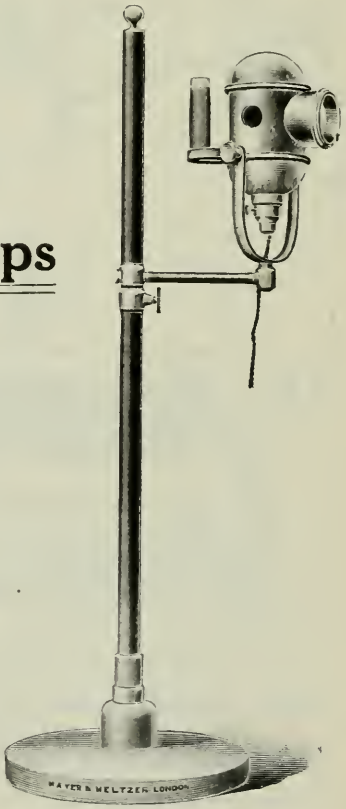

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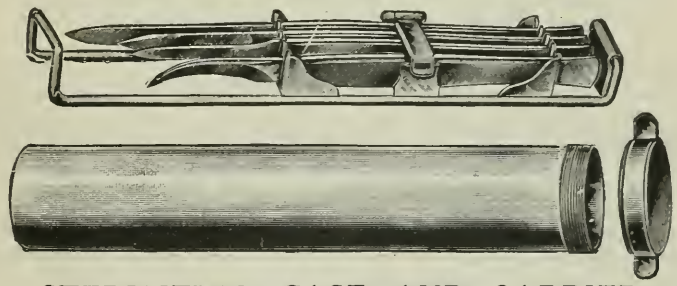

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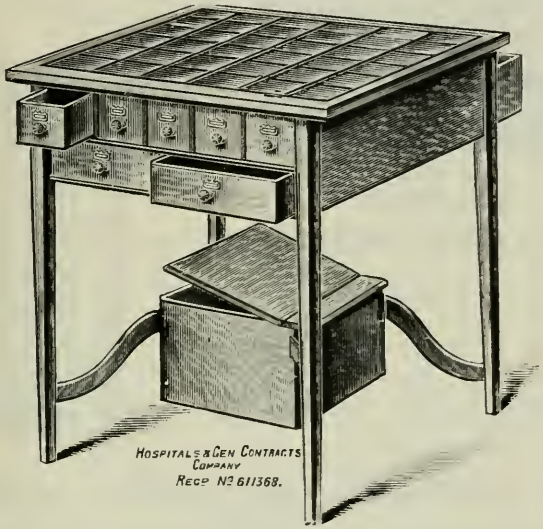

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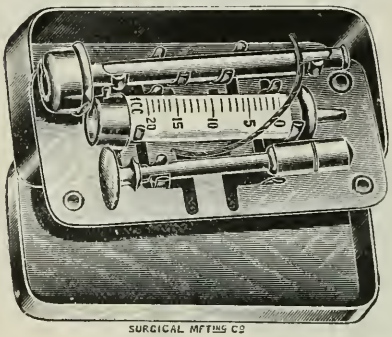

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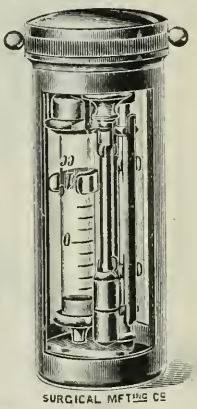

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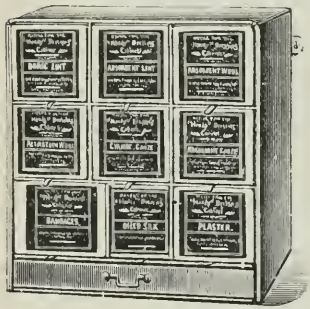

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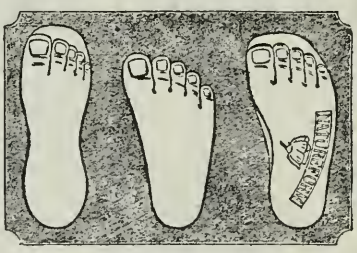

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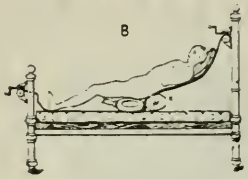
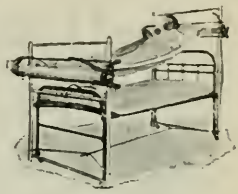
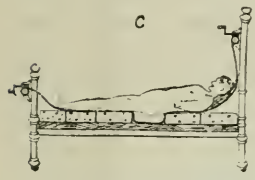


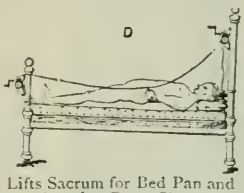
Lifts on Cushion for Bed Pan.



Lifts for making Bed underneath.



Lifts for Bed Pan, with Sectional Mattress.



Lifts Sacrum for Bed Pan and changing Draw Sheet.

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Wheels from Bed to Bed.

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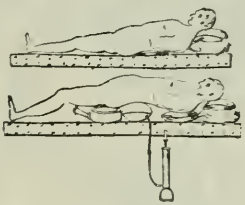

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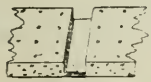
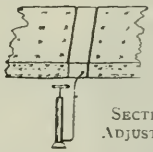


SECTION COLLAPSED.



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Lifts Sacrum for Bed Pan, or changing Draw Sheet.

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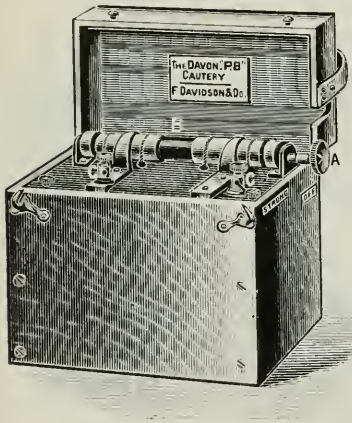

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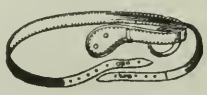

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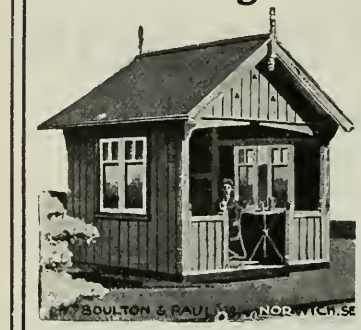

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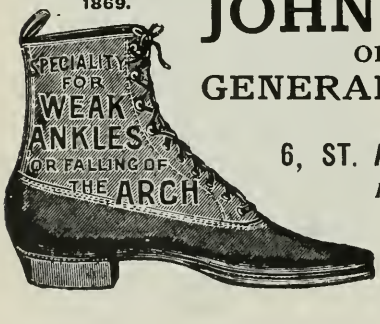

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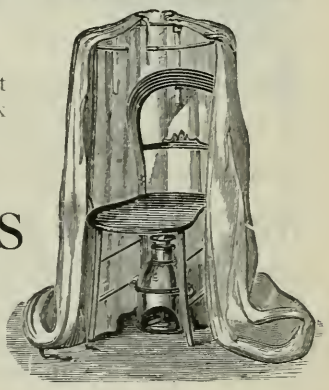

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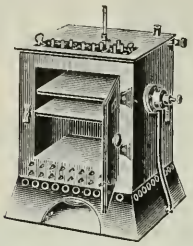

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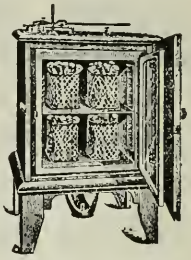

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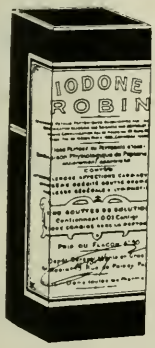

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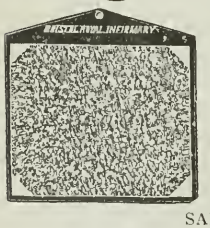

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